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ANC



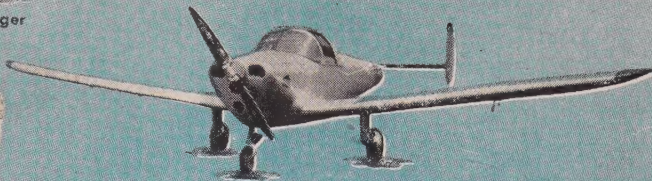




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speed, 150 mph...Range 500 miles...Requires only 560 feet to take off; 335 feet to land...Hydraulic landing flaps, power-retractable tricycle landing gear, hydraulic shock absorbers, and over-size tires make for pillow-smooth landings at slow speed, even in cross winds or on rough fields...185 hp engine and variable-pitch propeller assure safe, fast rate of climb. *Profitable* because it's *useful*, the Ryan *Navion* can be quickly converted to a light transport capable of carrying 645 pounds of bulky cargo in 55 cubic feet of easily loaded space. Both veteran and novice pilots...hundreds of business and professional men...are choosing the Ryan *Navion* for better air transportation at lower cost.

\* \* \* \* \*

Write today on your business letterhead for fully illustrated brochure and name of dealer near you who will be glad to give you a demonstration. ORDERS ON HAND are increasing daily, and are filled in sequence. You'll get earlier delivery by ordering your *Navion* now, well in advance. Address: Ryan Aeronautical Company, 211 Lindbergh Field, San Diego, California.

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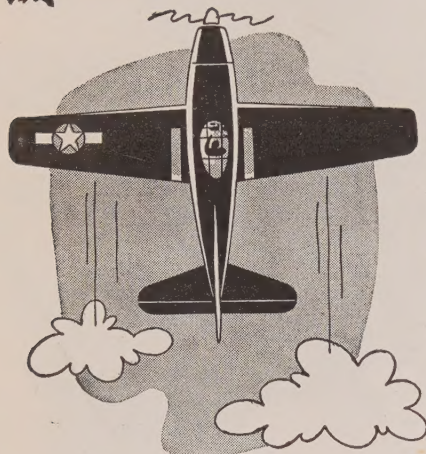
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# The Birdmen's Perch

By *Major Al Williams, ALIAS, "TATTERED WING TIPS,"*  
Gulf Aviation Products Manager, Gulf Bldg., Pittsburgh 30, Pa.



Sometimes we read the papers.

Sometimes we read a book.

But always we read the flying mags.

We love 'em and are certain that if we could remember everything we'd ever read in them, we'd be a genius.

One thing we do remember was a picture of an F-8-F.

The caption said that she took off in 115 feet!

The caption also said that she climbed to 10,000 feet in 100 seconds!

We can only add (a little weakly) that this is the kind of a plane we've been begging them to build for years.

## NO NOISE IS GOOD NOISE

Start out with a good airplane.

Put a 5-blade prop (at 1,000 rpm instead of 2,500 rpm) on the nose and you eliminate a lot of noise while increasing propeller efficiency.

Now add an engine muffler—the way NACA has done—and you get rid of so

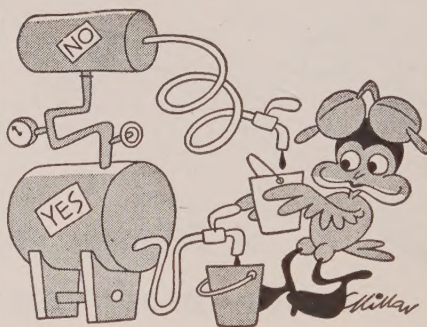
much unpleasant noise that it is scarcely believable!

Start out with a good crude oil.

Refine it with orthodox refining technique and you eliminate a lot of impurities while increasing lubrication efficiency.

Now add another refining step—the Alchlor process—the way Gulf has done—and you get rid of so much additional trouble-making hydro-carbons (the kind that break down into sludge, carbon and varnish) that it is scarcely believable.

In fact, we lose as much as 15% of the volume of the already refined oil we



started with, in the Alchlor process.

But what's left — Gulfpride Oil — has gained that much in lubrication efficiency in the most important engine in the world—*your* engine.

Are you sure your engine's been serviced with Gulfpride lately?

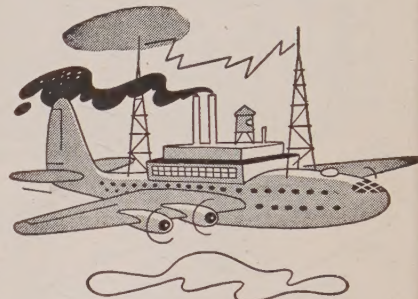
Better check.

## LITTLE KNOWN FACTS DEPT.

You oughtta know the rules by now!

You send us a "Little Known Fact About Well Known Planes" (that's why we've got our address on the top of the

page) . . . you also send us proof of your "Fact" . . . and if we use it in these hallowed columns, you get commissioned as a Perch Pilot (bottom rung). After



we've used 5 of your "Facts," you get promoted to Senior Perch Pilot!

Exciting, isn't it?

James B. Misner, of Sandusky, O. gets a commission this month because:

"The new super-transport generate enough electricity to light a small town, or to operate a large broadcasting station!"

Charles Ripley, N.Y.C., gets a commission because his firm of aviation insurance underwriters (isn't it the biggest in the country, Rip?):

"... had fewer payments to make for crashes than they did for windstorm losses in April!"

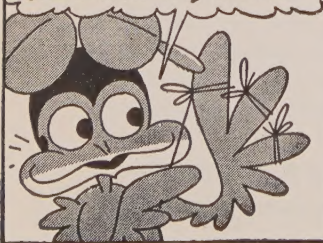
Okay, now you send in your Fact!

Gulf Oil Corporation and Gulf Refining Company... makers of

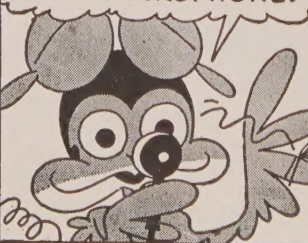


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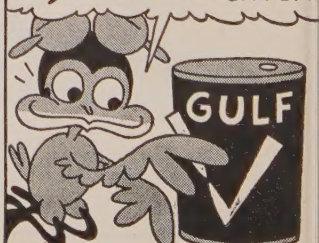
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GOOD GULF AVIATION GASOLINE TO CHECK.





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There are two SKYWAYS: English and Spanish

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 NOVEMBER 1947

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## AIR YOUR VIEWS

### Duster Info

Gentlemen:

Could you give me some information regarding crop dusting in the California area. It might help solve some problems for me.

HERBERT L. SILLIVAN

Los Angeles, Calif.

*Might we suggest that you read "Crop Dusters For Hire" in this issue. Dusters have helped to solve many a farmer's problems . . . and they probably can help you, too.—Ed.*

### More Dope, Please

Gentlemen:

Can you give me any information concerning the Aero-Flight Streak, other than that printed in your April issue?

LOWELL J. BAXTIE

Huntington, L. I.

*For more information than is included on page 21, this issue, write Aero-Flight Aircraft Corporation, Haskell Flying Service, Long Beach Municipal Airport, Long Beach, California.—Ed.*

### Hughes Hercules

Gentlemen:

In the Hughes investigation nothing was said about how long the big ship has been under construction and whether or not it will now be abandoned. Can you tell me?

FRED KOCH

New York City

*Gov't contract was awarded November, 1942, and work was begun on the Hercules early in 1943. In interviews, Hughes has been reported as planning to continue its construction.—Ed.*

### Costly Economy

Gentlemen:

Your editorial "Costly Economy" in the August issue should have widespread publicity. This threat to our national security, ignoring our general national well-being otherwise, is being attempted by some of the same persons that cut our much needed preparations prior to Pearl Harbor. . . . These same persons during the war were preaching far and wide that our armed forces would never again be permitted to dwindle to an extent that we could not at any time defend our nation. Political plums seem to mean much more to those persons than national se-

curity. The world is not peaceful enough yet to permit our scrapping our defenses.

Not mentioned in your editorial but of desperate necessity to our national safety is the continued experiments and research needed to at least allow us to keep pace with world transportation and communication. Private flying is and will continue paying its own fare, provided it is not too dangerously legislated against. Our nation cannot but suffer if our Congress prevents continued developments and improvements.

C. W. PATE

Dunsmuir, Calif.

*SKYWAYS is grateful to Mr. Pate and to the many others who have written and wired us regarding that editorial. We are grateful, too, for the support of those readers.—Ed.*

### Cover Question

Gentlemen:

Why have you changed your covers from drawings to photos?

PETF MARKEY

Los Angeles, California

*When we had drawings on the cover, many readers wrote us asking for kodachromes. Now that we are using kodachromes, many want the drawings back again. We'll try to make it a crosswind landing and please both camps with here a kodachrome and there a drawing.—Ed.*

### BT Banter

Gentlemen:

I read about Dr. Kerr soloing a BT-13 in 49 hours, 50 minutes flying time. Well, we have a lad here in Sapulpa who bought a BT-13 when he was 16 and he soloed it after only 7½ hours solo time in a lightplane. This youngster now has his third plane, an SN-V1 . . . and he earned the money for these planes by working as a messenger for Western Union.

MRS. JOHN ECHOLS

Sapulpa, Oklahoma

Gentlemen:

I think Dr. Kerr did a nice job, soloing his BT after only 49 hours, 50 minutes of logged time. But I think I can top that. I bought a BT when I'd had only 4 hours solo in a 65-hp Aeronca. I took 4 hours dual in the BT and then soloed it. Then by the time I had my private ticket, via the G.I. training, I'd acquired 60 hours solo in the ship.

The BT is swell, but I don't like it for aerobatics.

MARLOW WEBB

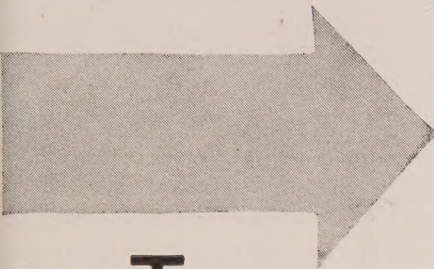
Utica, Mich.

*Congratulations to both young BT pilots.—Ed.*

SKYWAYS



Here's News!



The CAA estimates that within the next 10 years there will be 750,000 new jobs in aviation. If you want to get ready today for a new and bigger future in aviation, don't fail to order your copy of this book now!

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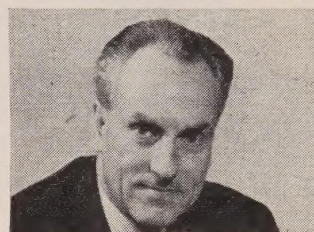
Where do you fit in?

# YOUR FUTURE IN AVIATION

Edited by

**J. FRED HENRY**

Editor of *SKYWAYS*



The romantic dream of yesterday is today a cold, hard fact. The Air Age of Tomorrow is here. Now is the time to get in on the ground floor of one of the world's biggest industries—aviation. Choose your career now — and prepare yourself for it. WHAT CAN YOU DO? WHAT WILL BE YOUR PLACE IN THE INDUSTRY? WHERE DO YOU FIT IN? WHERE ARE THE JOBS AND HOW CAN YOU FIND ONE?

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YOUR FUTURE IN AVIATION goes down the line. Nothing is left out. MAINTENANCE AND REPAIR, RADIO AND COMMUNICATIONS, AIR TRAFFIC CONTROL, PASSENGER TRAFFIC, AIR CARGO, METEOROLOGY, NAVIGATION, AIRPORT OPERATION AND SERVICE, AIRPLANE ACCESSORIES are but a few of the fields covered.

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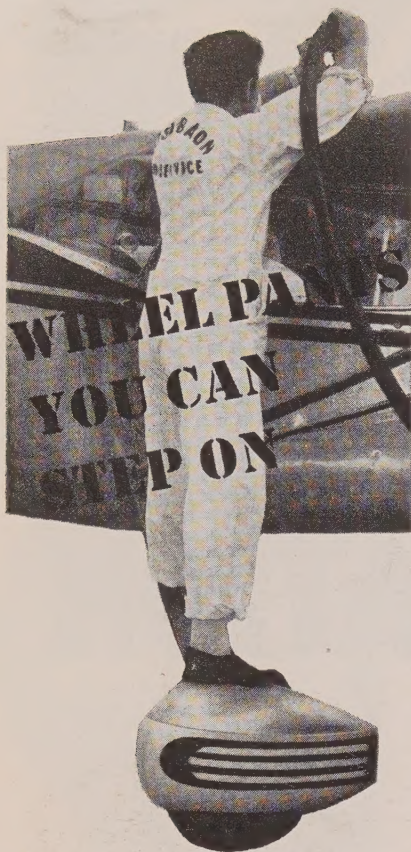
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# PROP WASH

## Aero Oddities

**Over The Top.** Pilot made a forced landing due to darkness. When he returned next morning to get plane, pilot found it guarded by State Trooper who fined him \$10 and told him to go to nearest airport for take-off. Pilot taxied his plane down country road, came to crest of hill, shot down it like you-know-what. When car approached from opposite direction, gulping pilot gunned engine, took off with his wheels just skimming top of car, left State Trooper in state of collapse. (Wm. J. Murphy, Hyde Park, Mass.)

**Pennies From Heaven.** San Francisco att'ny opened envelope with no return address sent him via regular air mail from Switzerland. Out tumbled \$7,073 in small bills... a first installment on a \$60,000 cash estate being sent one of the attorney's clients. (C. Markey, Chillicothe, Mo.)

**Pop Bottle Battle.** Yankton (S. Dakota) pilot spotted coyote from his lightplane. Having no gun, pilot tossed an empty pop bottle at fleeing animal. First toss was "near miss," second one hit coyote in head, killing it. (D. W. Hansen, Decatur, Ill.)

**Hot Pot Pilot.** Oakland (Nebraska) pilot Byron Appleby was approached by Mr. and Mrs. George Cady who asked him to make hurry-up trip to their home in Decatur... and they weren't kidding. Pilot Appleby flew to the Cady home, turned off fire under pot of rice on the Cady stove, returned to Oakland to tell Cadys they could continue their trip without concern. (A. B. Pearson, Iron Mountain, Mich.)

**Don't Look Now But.** Instructor Varnes, while on X-C with student, noticed large level pasture below on the left, decided to give student forced landing. Varnes pulled back throttle, then asked student, "Now where would you land?"

Student pointed to field on the right. Wondering why his student had to make all the usual mistakes, Varnes asked, "Why?" Student replied, "'cause it's an airport." It was. (G. Gloyde, Burbank, Calif.)

**Aerial Herder.** Airport Manager Ware discovered sheep gazing in center of field, took off in Cub, buzzed sheep back into own pasture, then landed Cub to tell farmer to fix his fence. (R. Clark-son, Lawrence, Kansas.)

**Down But Not Out.** Pilots Caswell and Elliot flew PT-19 to friend's ranch, landed in field near house. The landing was good, but soil was too soft for take-off. Pilots Caswell and Elliot removed right wing from plane, took down sections of fence, towed PT-19 three miles to dirt road, put wing back on plane, then took off amid cheers of large crowd of neighboring ranchers. (H. F. Caswell, Santa Monica, Calif.)

**Plane At 6 O'Clock.** During first flight lesson, student tapped instructor on back and said, "there's a plane right in back of us." Instructor turned around, saw no plane, so S-turned for better visibility. Seeing no plane, instructor told student he was seeing things. Student looked again, replied, "I do see a plane... I can see its wing tip behind us." Student was looking at tip of own airplane's stabilizer. (J. S. Hamilton Jr., Earle, N. J.)

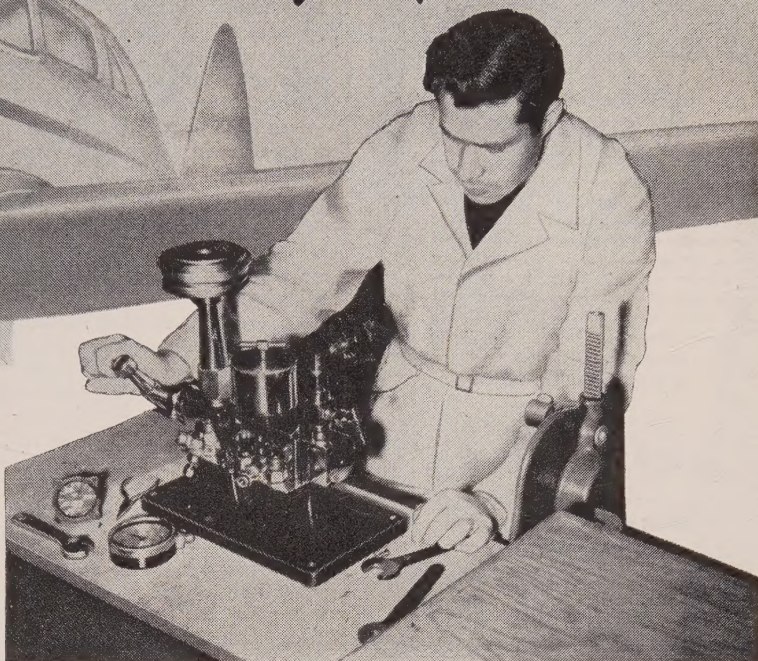
### Att'n Readers:

If you have any news-note oddities pertaining to aviation, send them to SKYWAYS, Box 17, 444 Madison Avenue, New York 22, N. Y. Five dollars will be paid the sender of each "oddity" printed. Contributions cannot be returned unless accompanied by stamped addressed envelope. The decision of the editors is final.



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# An American Tragedy

## AN EDITORIAL



### Right on the Nose of the STINSON 165

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**S**HALL we have another Pearl Harbor? Two years after "victory," with peace a frail wraith in blood-draggled skirts, we stand stripped before the world—a giant almost without weapons. Nowhere in the zones of occupation do we have enough fighting men and materiel to meet an attack—even if, for example, the Russians choose to provoke an "incident," directly or indirectly.

Our Air Arm, which should be our spear-point at the throat of any potential enemy, is undermanned, underequipped, begging for recruits. Yes, we have the Bomb. It is still a tremendous weapon. But the time when we shall have it exclusively grows shorter and shorter. Once again it is necessary to repeat the ominous words: *It is later than you think!* It is Post-Bikini Time and the clocks are ticking the minutes away faster and faster—on a scale of geometric progression, with democracy and civilization as we know them clinging to the edge of the abyss.

True, we have achieved a faint, false dawn. The Air Forces are at last masters in their own house, but they are still dazed from having won their two-and-a-half decade battle. They speak with awe of the fact that the Congress gave them a few hundred more airplanes than the Bureau of the Budget had apportioned them. General Spaatz—as reported last month—has said grimly that we will have a 55 Group Air Force by January 1—or else!

Last year, it was to have been a 70-Group AF. Congress granted \$145,000,000 for AF research and \$75,000,000 for the Navy—but the Russian appropriation this year is *One and a Half Billions*.

General Eisenhower has said recently: "We believe the air force represents the only immediate weapon available for retaliatory action if we are attacked. We must at all times have an air force—in being. . . . A Striking Air Force, the spearhead of our professional armed services, would be charged with the crucial mission of defense by attack. Its job would be to stop the enemy's first onslaught and to hit back at him with crushing force. *We believe that an aggressor's reluctance to start a war, and his handicap in prosecuting it successfully if he did start, would be in direct proportion to the power and readiness of our mobile striking force.* Its personnel would have to be highly trained and its equipment would have to be the most advanced in the world."

What is our situation today? Eight out of 12 major aircraft companies report serious losses in 1946 and semi-annual reports for 1947 show a similar picture. The banks consider them unsafe risks and refuse loans. It is rumored that, at a recent meeting of the AF Procurement Board, the decision was made as to which of the companies should be kept alive. There is only so much money and it will stretch only so far. Yet the time element is all important in industrial mobilization. Skilled men and

increasingly devious types of planes are not ours overnight.

The Air Coordinating Committee has done yeoman service. Now the President's Temporary Air Policy Commission and the Joint Congressional Air Policy Board are investigating to see what must be done. We have had such investigations *ad nauseam*—no fewer than 25 between World War I and 1925, when the Morrow Board reported; many more since then. But we still have no national air policy! The President's letter to his Commission said, in part: "The final recommendations of the Commission must go beyond the limits of any one phase of aviation. They should be so broad in scope and purpose that they will assist in revising old policies and in framing new ones, and will serve as a guide for formulating a carefully considered national air policy. *Because of the urgency of the problem,* I request the Commission to submit its final recommendations to me by January 1, 1948." (The Congressional Board is to report to the Congress by March 1, 1948).

Long-range procurement legislation, allowing the AF, the Navy and the aircraft industry to schedule production potentials at least five years ahead is imperative. (It takes a minimum of five years to design and develop a new-type plane.) Planning now can only be done a year at a time, on a basis of minimum production. Unless there is relief, the industry will be at a standstill by the end of 1948, so beaten by financial losses that it will lose the last of the design and production teams built up over periods of 10 to 20 years. Sales of the 12 largest companies declined from almost 6 billion dollars in 1944 to three-quarters of a billion in 1946. The airlines are in an equally bad spot, with net operating loss of 16 domestic lines for the first quarter of 1947 set at \$18,746,184, compared to \$4,364,281 for the same quarter of 1946.

Even England, in its dire straits, has placed government contracts with British manufacturers for development of eight jet and turbo-prop transport types. No contracts for such types are known to have been placed in this country, and the cost of developing one such aircraft would exceed the total net working capital of all except one or two airlines and two or three manufacturers. The cost of developing jet fighters far exceeds that of the fighters we had when the last war began.


These are only a few of the shadows across the picture. We have not yet broken the sonic barrier but we are close to it. Scientists are talking of speeds up to 7,500 mph and of planes which will operate in space. Not today, but tomorrow comes too fast for the laggards.

We no longer possess the moat of our oceans. Our back fence in the Arctic is gone. Guided missiles respect no pretty statesmen's rules. You, as an American citizen, have a right to tell your Congressman what you think. The clock—Post-Bikini time—moves inexorably.

—J. FRED HENRY

SKYWAYS





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# Where to Fly

## New Jersey

The state of New Jersey, terrain-wise, offers both flatlands and mountains. Throughout New Jersey there are airports offering sport and recreational facilities for visiting airmen. Also, the proximity of many New Jersey airports to such metropolitan areas as Philadelphia and New York makes the state an excellent stop-off port for plane owners planning to enjoy urban facilities.

### Personal Pilot Information:

**Sussex County—Trinca Airport—Andover.** (Cl. 1) El. 600 feet. Sod strips, N/S and NE/SW. Circle on hangar, wind cone. Overnight tie-down fee. Hangars, major repairs, 73 Octane fuel. Taxi to town, 2 miles. Over-night facilities available, meals, etc., for visiting airmen. (New York Chart)

**Somerset Hills Airport—Basking Ridge.** (Cl. 1) El. 250 feet. Sod strips, E/W, N/S and NW/SE. Wind cone. Hangars, major repairs, 80 Octane fuel. Some food available at field. (New York Chart)

**Lake Susquehanna Airport—Blairstown.** (Cl. 2) El. 380 feet. Sod runway, NE/SW. Name on hangar, wind tee, cone. Hangars, major repair, 80 Octane fuel, 24-hour service. Overnight tie-down fee. Airport station wagon provides transportation to town. Lodging, meal facilities available at resort hotel adjacent to field. Fishing, bathing, boating, tennis, badminton available during summer season. Hunting, skiing, tobogganing, ice skating offered during winter. Excellent flight training school in operation. (New York Chart)

**Martins Creek Airport—Belvidere.** (Cl. 2) El. 340 feet. Sod runways, NE/SW and NW/SE. Boundary day markers, wind cone, tee. Hangars, major repairs, 80 Octane fuel. Tie-downs. Meals at airport, overnight accommodation at Pilots' Club half-mile from

field. Free car to town 2 miles. All sports offered at Pilot's Club (New York Chart)

**Morrisville Airport (Pa.)—Trenton.** (Cl. 2) El. 60 feet. Turf strips, E/W, NW/SE and N/S. Wind cone on hangar. Major repairs, 73 Octane fuel. No tie-down fee. Lodging accommodations nearby. Taxi, bus to Trenton. Car rental in Trenton. (New York Chart)

**Nassau Airpark—Princeton.** (Cl. 2) El. 80 feet. Sod strips, NNW/SSE and NE/SW. Wind cone and tee. Hangars, minor repairs, 80 Octane fuel. Tie-down charge (nominal). Private car or bus to Princeton. Hotel, inns, tourist homes in Princeton. Food available at field. Pilots flying to Princeton football games use Nassau Airpark. Transportation to stadium. (New York Chart)

**Red Bank Airport—Red Bank** (Cl. 2) El. 80 feet. Turf runways, N/S and E/W. Wind cone, rotating beacon, flood and obstruction lights. Hangars, major repairs, 80 Octane fuel. Meals at airport. Overnight lodging available in Red Bank. Taxi to town 1 mile. Bus available at airport for transportation to shore district. (New York Chart)

**Solberg-Hunterdon Airport—Readington.** (Cl. 2) El. 200 feet. Clay, sod strips, NW/SE and NE/SW. Circle on field. Hangars, major repairs, 80 Octane fuel. Restaurant on field. Airport car to town 1 mile. (New York Chart)

**Somerset Airport—Somerville.** (Cl. 2) Sod runways, E/W, NW/SE and N/S. Traffic tee at runway intersection. Airport's lights on call. Hangars, major repair, 80, 90 Octane fuel. Lodging and meals all hours in town 4 miles. Taxi available. Hunting, fishing, swimming available near airport. (New York Chart)

**Colts Neck Airport—Colts Neck.** All turf field. Wind cone. Hangars, minor repair, 80

90 Octane fuel. Restaurant nearby. Transportation to town. Night accommodations available Colts Neck. All sports, including horse racing, within 10 miles. (New York Chart)

## Washington

Big is the word for the state of Washington . . . big mountains . . . big dams . . . big lakes . . . big trees . . . big everything. Being laden with personal plane facilities, and things to do when you get there, it's a big state for the personal-plane pilot, too.

### Personal Pilot Information:

**Cle Elum Airport—Cle Elum.** (Cl. 1) El. 1930 feet. Cinder strip, E/W. Wind cone. Hangars, minor repairs, 80 Octane gas. No tie-down fee. Meals, tourist cabins at Cle Elum. Airport car to town, 2 miles, no charge. Stop here for weather and field information before crossing Cascade Mountains en route farther west. (Seattle Chart)

**Forks Airport—Forks.** (Cl. 1) El. 286 feet. Turf strip, NE/SW. Wind cone. 80 Octane fuel. No tie-down charge. Airport car to town 1 mile. Hunting, fishing available. (Seattle Chart)

**Ilwaco Airport—Ilwaco.** (Cl. 1) El. 8 feet. Sod strip, NW/SE. Boundary day markers. Wind cone, traffic Tee. Hangar, 80 to 91 Octane fuel. Tie-down charge. Airport car to town 2½ miles. Meals served at airport. Airport is situated at mouth of Columbia River, offers excellent fishing, etc. (Seattle Chart)

**Seattle Sky Ranch—Issaquah.** (Cl. 1) El. 50 feet. Sod strips, N/S. Wind cone, traffic tee. Lights on request. Tie-down charge. Hangar, major repairs, 73 to 80 Octane fuel. Meals and arrangements for cabins at airport. Airport car available. (Seattle Chart)

**Westport Airport—Westport.** (Cl. 1) El. 5 feet. Sod strip, NW/SE. Boundary day markers, wind cone. No tie-down charge. 73 to 80 Octane fuel. Meals, overnight accommodations in town 1 mile. Airport car available. Field closed Nov. to April. Excellent fishing nearby. (Seattle Chart)

**Coulee City Airport—Coulee City.** (Cl. 2) El. 1600 feet. Gravel strips, E/W and NE/SW. Wind cone. No tie-down charge. Major repairs, 80 Octane fuel. Cabins, meals, hotel in town. Airport car will take you to fishing, hunting, golfing, etc. area on nearby lake. (Spokane Chart)

**Coulee Dam Seaplane Anchorage—On Roosevelt Lake.** Unmarked landing area, ENE/WNW 5 miles. Landings not permitted within 2 miles of dam. Beaching and hauling-out equipment available. Marine railway. Hangar, 73 Octane fuel. Restaurant at Base. Hotel reservations made, if notified in advance of arrival. (Spokane Chart)

**Editor's Note:**—Airport information supplied in the "Where to Fly" columns is to be used as supplementary material only. For detailed information we suggest that you consult CAA's Airman Guide. We invite your criticism and correction of any errors that might occur. Your help will help us to provide personal pilots with accurate and necessary airport data.



# Standard of California's **PLANE FAX**



A page of service tips for private flyers and fixed-base operators

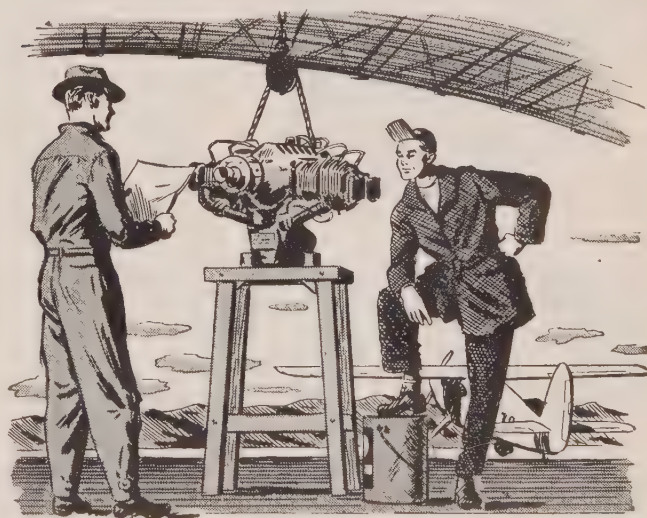


## Lubrication Charts Now Available

Just as important as the oil in your engine are the oils and greases you use on other parts of your plane. Lubricants for fuselage, landing gear, controls and accessories should "fit" their jobs as well as RPM Aviation Oil lubricates vital engine parts. That's why Standard Airport Dealers follow factory-approved lubrication charts for your type of aircraft. These charts show every lubrication point and specify the proper lubricant for most efficient operation. Give your plane the protection and added efficiency that is assured when your lubrication needs are handled by Standard Airport Dealers.

## Fixed-Base Operators Must Watch Costs

Accurate accounting, financial integrity and low maintenance costs are three essentials of sound fixed-base operations. That's why many operators interested in reducing maintenance costs rely on RPM Aviation Oil to increase substantially the time between overhauls of aircraft engines. One reason for this is the "detergent" in "RPM" that actually keeps pistons and cylinder walls cleaner, keeps rings free and ring grooves ungummed.

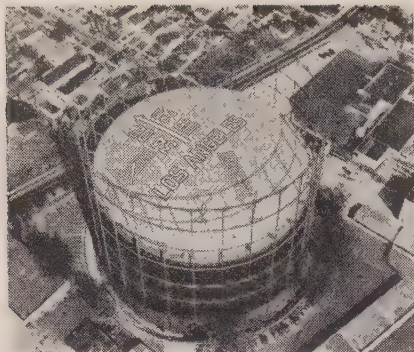


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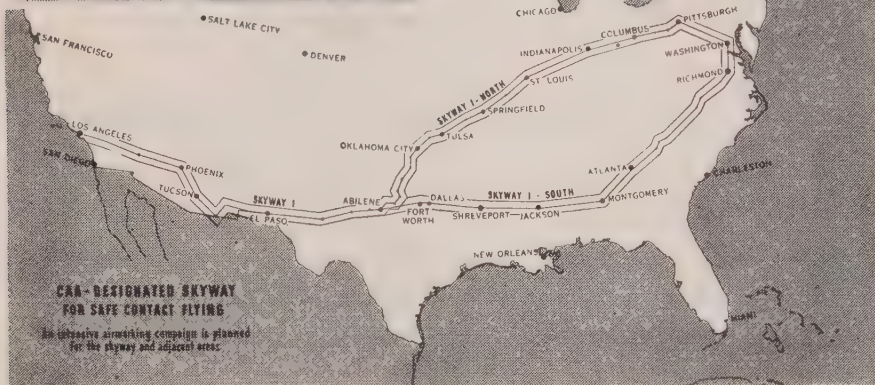
For private flyers, good at airports throughout the United States, Canada and Alaska. If you reside in the West, write Standard of California, 225 Bush Street, Room 1618, San Francisco 20, California or ask the Standard Airport Dealer at your field for an application blank.







**SKYWAY** for personal-plane pilots is an aerial highway between Los Angeles and Washington, D.C. Markers (left) will be used to mark the skyway across country



## HANGAR FLYING

**P**ILOTS, now's the time to say "thanx" to the Los Angeles Chamber of Commerce and Washington (D. C., that is) Board of Trade. These two enterprising groups recently announced their efforts toward establishment of a transcontinental skyway for private aircraft. Right now survey flights are being made to determine best route for personal planes between Los Angeles and Washington. Cities and towns along the chosen route will be encouraged to establish ground markings to aid the pilot in his X-C navigation.

Tentative plans call for 40-mile wide East/West skyway, with one route going east by way of Arizona and Texas, with a branch north through Oklahoma, Missouri, Indiana, Ohio and Pennsylvania; and a second route by way of southern states and north over the east coast by way of Atlanta, Georgia.

This plan for a transcontinental skyway for private planes is receiving the enthusiastic support of the Personal Aircraft Council. So, pilots, perhaps the time is near when you can fly your own skyways coast-to-coast just as easily as automobile drivers follow highways.

*MANUFACTURERS and Traders Trust Company of Buffalo, N.Y., have suggested a new way of making that last-minute dash to the bank . . . whether it's to deposit money or to take money out. At opening of a new branch, a depositor rode a Bell 'copter to the very door of the establishment. Maybe a few years from now bank cashiers will be caged on the roof to facilitate such high-flying finance.*

A NEW DOUGLAS may soon be on the way! With the DC-3 no longer in production, discussions are underway at Douglas Aircraft regarding a successor to the famed DC-3. This new one, if and when it is built, will be called the DC-9, will be slightly larger than the DC-3, will carry 28 passengers at a cruising speed of 257 mph, and will include provisions for cabin pressurization. Whether this ship will ever be put into production depends upon its acceptance by airlines.

**QUESTIONS:** *How much does an airliner cost? Well, here are a few answers to that one. Following prices are listed as domestic . . . and basic. In other words, the more seats and pushing an airliner gets, the more, above this list price, the flying machine will cost.*

*Convair-Liner: \$360,000 (Consolidated-Vultee, 40 passengers)  
Stratocruiser: \$1,250,000 (Boeing, 80 passengers)  
DC-3: \$135,000 (Douglas, 28 passengers)\*  
DC-4 \$460,000 (Douglas, 44 passengers)\*\*  
DC-6: \$640,000 (Douglas, 52 passengers)  
Constellation: \$800,000 (Lockheed, 64 passengers)*

*\*—Not in Production, Prewar price*

*\*\*—Not in production, Postwar price*

*Tidy sums, eh? But you get a lot for your money, too.*

SEAPLANE pilots should be inspired by the recent CAA proposal which calls for establishment of some 250 major seaplane bases throughout the U.S. According to Theodore M. Wayave, Chief of Seaplane Facilities Section of CAA, present goal is to have at least one major seaplane base available to X-C pilots every 125 miles. This will do a lot toward removing a stumbling block in the path of the growth of seaplane flying.

*LIKE THE sorcerer's apprentice who precipitated a flood, Argentina's Juan Maguire set out to get plane tickets for a two-week vacation in Rio de Janeiro and then came away with tickets for a round-the-world flight and a six-months vacation. Senor Maguire, who owns a large cattle ranch in Argentina, had never been farther away from home than neighboring Brazil, and he'd never ridden in an airplane. Therefore he decided to fly to Rio. But while the Pan Am ticket clerk was checking a time-table, it occurred to Maguire that he'd never seen Havana . . . and it didn't take long to get there via plane. Then Miami came next . . . and finally New York, Madrid, Rome, Paris, London, Istanbul, Karachi, Calcutta, Kunning, Hong Kong, Shanghai, Peiping, Manila, Guam, Wake, Midway, Honolulu and San Francisco. Senor and Senora Maguire's few hundred mile trip snowballed into a 33,567-mile trip around the world.*

**GOOD NEWS DEPT.:** Piper Aircraft's Cub Haven Airport has inaugurated a service that'll meet the approval of all visiting airmen. Cohick's U-Drivit Company, in conjunction with Piper, has a fleet of Crosleys at the field. They can be rented by the visiting pilots for \$2 for 6 hours.

Glenn L. Martin's 202 has been NC'd by CAA . . . is first postwar twin-engine airliner to be CAA-certificated.

The Canadian de Havilland Company recently announced a new all-metal five-place plane designed for bush operations. There will be both a land and seaplane version. Powered by 450-hp Pratt & Whitney, the new ship will cruise at 146 mph (at 5,000 feet), have a 580-mile range (on 70 Imperial gallons fuel). Another version powered by 295-hp de Havilland engine will cruise at 134 mph, have 750-mile range. Both versions are fitted to carry a 16-foot canoe on one float.

**NEW CAA report on airports** shows an increase of 22 per cent since last year, and total of registered aircraft went from 57,488 to 93,920. Total airports in operation in the U.S. number 10,502 (including commercial, municipal, CAA Intermediate, military, etc.) (Continued on page 49)



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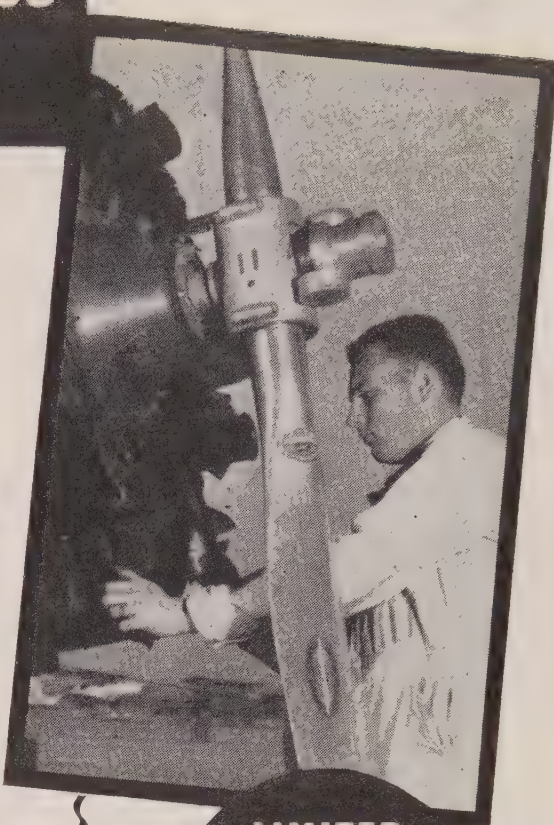
You, as a California Flyers' graduate mechanic, can always feel secure in your position . . . *because you will be protected at all times by a Government License.* As in the case of a lawyer or doctor, your license is positive evidence of your fitness, and it prevents the unqualified from practicing your profession.

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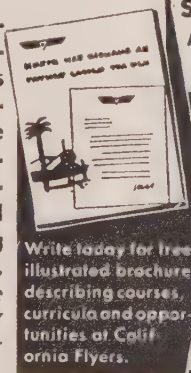
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**NAVAL AIR RESERVES**, prior to going on duty, are given exam by Flight Surgeon



**EYE CHECK** is part of physical for Air Group's pilots



**GROUND SCHOOL** calls for minimum of four hours in Link

# NAR's On Duty

By **RALPH YAMBERT**

**H**UNDREDS of Naval airmen have returned to active duty during the past several months. Entire squadrons of fleet fighters and bombers have kept the air busy around 21 Naval Air Stations in the U. S. With the same zest displayed in the early days of the war, the fighters are shooting live bullets, the bombers are dropping real bombs.

The boys are not back in the cockpits because of any emergency—not, either, because they've tired of the civilian battle and prefer to sit with control sticks instead of pencils in their hands.

These airmen are Reserves. Their active duty is of only two-weeks duration; after it is finished, they will return to jobs in industry, business and the professions. Some men will go back to school.

In the five months between February and July more than 6,000 Naval and Marine reserve pilots completed a two-week active duty period, according to Rear Admiral E. C. Ewen, Chief of the Naval Air Reserve Command. Enlisted men in even greater numbers served alongside these officers, just as they did in wartime. At Admiral Ewen's headquarters in Glenview, a short distance from Chicago, nearly a thousand officers and men returned to duty in two-week increments.

All this is part of the Navy's plan to maintain the Air Reserve on a battle-ready basis. It has changed Naval Reserve flying from a week-end to a seven-day-a-week basis. It was accomplished smoothly and enthusiastically by the lads who participated—and every man who came to duty did so of his own free will. In all cases he had the support of his employer and in most cases his two-week military duty was in addition to a two-week vacation to be enjoyed at another time.

These facts are for people to ponder . . . those people who think this country is in the grip of postwar apathy!

Tall, sandy-haired Maurie Wells—Lieutenant Commander M. I. Wells—sat in my office a few weeks ago to tell me of the part his Air Group played in this picture. With him was another Lieutenant Commander, Rube Denoff, a dark chap of medium height. Both men have sparkling war records and started their Naval careers at Glenview. Maurie now works for the Veteran's Administration in Chicago as a Civilian and is Commander of Air Group 82 in



**ENLISTED MEN** attached to Air Group 82 went to lectures, kept planes flying, operated radio, tower





**SIMILARITY** between wartime, peacetime duty is strictly on purpose. Officers, enlisted men follow Navy plan to maintain Reserve on battle-ready basis. Pilots brush up on electronics, flying, weather, etc.

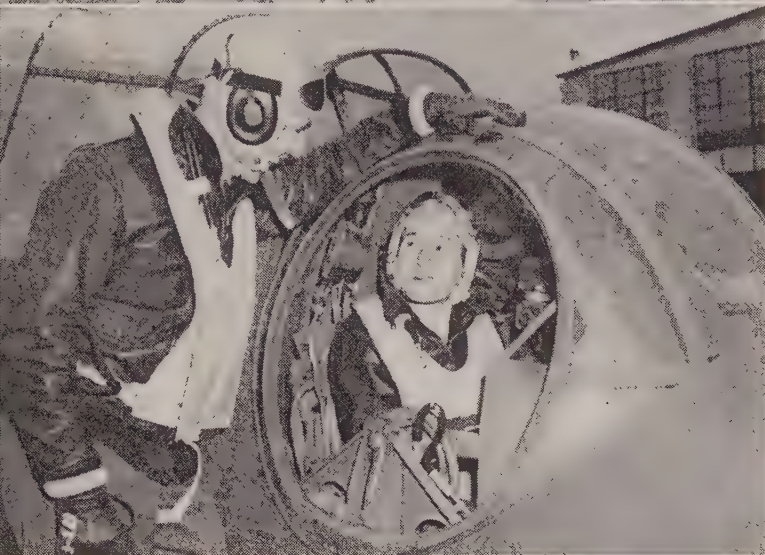
the Organized Reserve. He flies a Grumman F6-F *Hellcat*, has been a fighter pilot since he got his wings in Pensacola in February, 1941.

Rube Denoff, also a reserve and a fighter pilot, is on full-time active duty at Glenview. He is Type Training Officer there, which makes him the man who co-ordinates the flying of all reservists at this base close to the shores of Lake Michigan.

I asked both men to give me a brief of a two-week active-duty period. Air Group 82 was the first to come on duty at Glenview, and so set the pattern for the others that followed. Air Group 82 is a CVE (small carrier) outfit, made up of two squadrons. There is a fighter squadron of 18 *Hellcats* and an attack squadron comprising 12 Grumman TBM *Avengers*. The group has its own ground and air crewmen, ground officers and pilots. In a national emergency the group would immediately man a







**RESERVISTS, in officer-and-enlisted-man teams, load live ammunition in Hellcat's guns. Bombers carried live bombs. Many of the men who flew together in combat are back flying together as Naval Air Reserves**

carrier now in the reserve fleet. The movement would be made swiftly, with a minimum of red tape.

"We set up this duty so that every man would get in the maximum amount of flying," Rube Denoff explained. "Our aim was 45 hours of air time per pilot and an equal number of hours in ground school. We did it, too!" he said with a grin. That figures out to be nearly four hours of flying daily for each pilot.

From Maurie Wells I learned that the two-week period was similar in all respects to a full-time return to duty. Orders were first issued to each man who had indicated his willingness for the duty. Each then reported aboard the Naval Air Station at Glenview, logged in with the Duty Officer, and then stopped at the Dispensary for the inevitable physical examination.

"Most of the men live close by," Wells pointed out, "but a few bachelors preferred to live on board." These men were given quarters at BOQ.

Checking in was completed in a few hours, so that the afternoon of the first day was spent in outlining the routine to be closely followed on subsequent days.

"The men were divided into two sections," continued Denoff. "One section flew in the mornings and took ground school in the afternoons. The other section alternated." During the second week the sections reversed this procedure so that those who flew mornings switched to the afternoon hours.

The flying, I learned, took in all phases. Periods were devoted to gunnery, bombing, tactics, night flight, instruments, navigational hops and cross-country. The latter took squadron members as far as Pensacola, a thousand miles away.

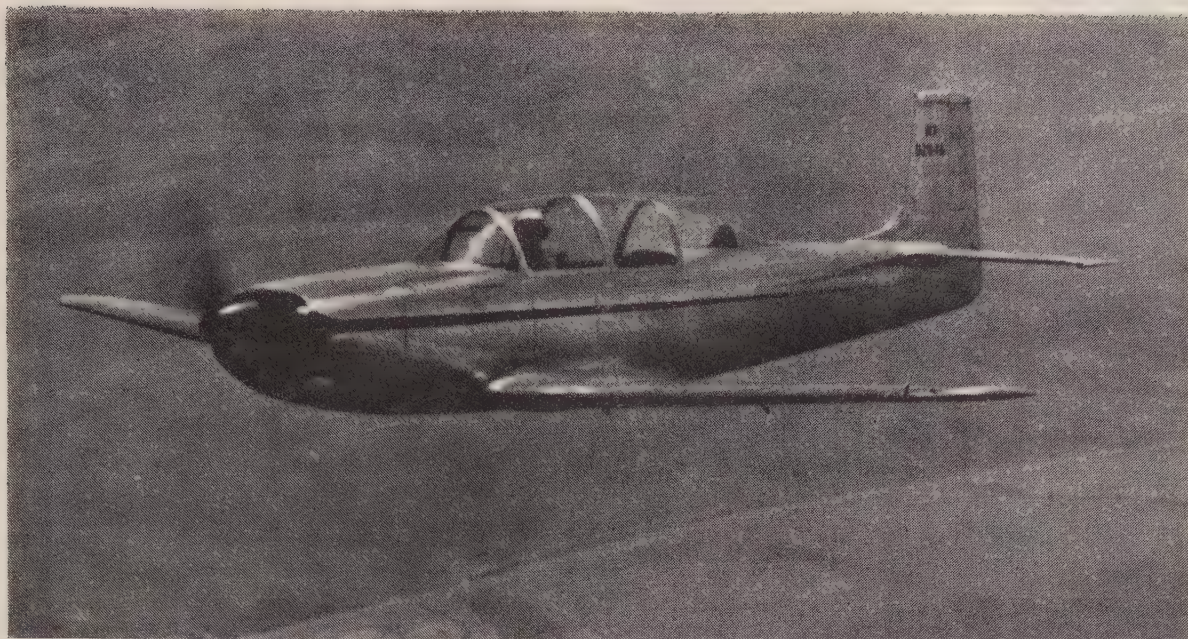
The flight curriculum is serious business during all reserve sessions. Fleet problems are undertaken with all the earnestness of regular Naval pilots. These men are combat veterans; they know that crack technique can mean the difference between success and failure in actual shooting conditions.

"All of us had flown together week-ends, so this duty just continued—on a more concentrated schedule—what we were already doing," Wells emphasized.

Ground school was also organized. Each pilot was expected to get in at (Continued on page 62)

**GREEN STUFF** that folds is part of this NAR picture, too. Men and officers draw full pay and allowances for their rate or rank. Flying curriculum included gunnery, bombing, tactics, night flight, X-c's, etc.





**AERO-FLIGHT STREAK**, a newcomer to the personal-plane field, is a two-place, all-metal ship, with flaps

# EXPERIMENTAL

**H**ERE are two new airplanes, at present being readied for NC tests, that will interest personal-plane enthusiasts. They are the Aero-Flight *Streak* (above) and the Baumann *Brigadier* 250 (below). Both are undergoing extensive tests out in California.

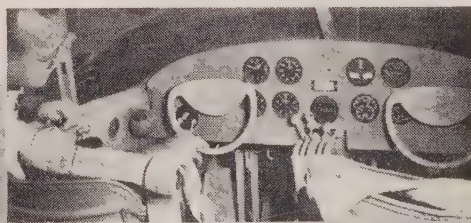
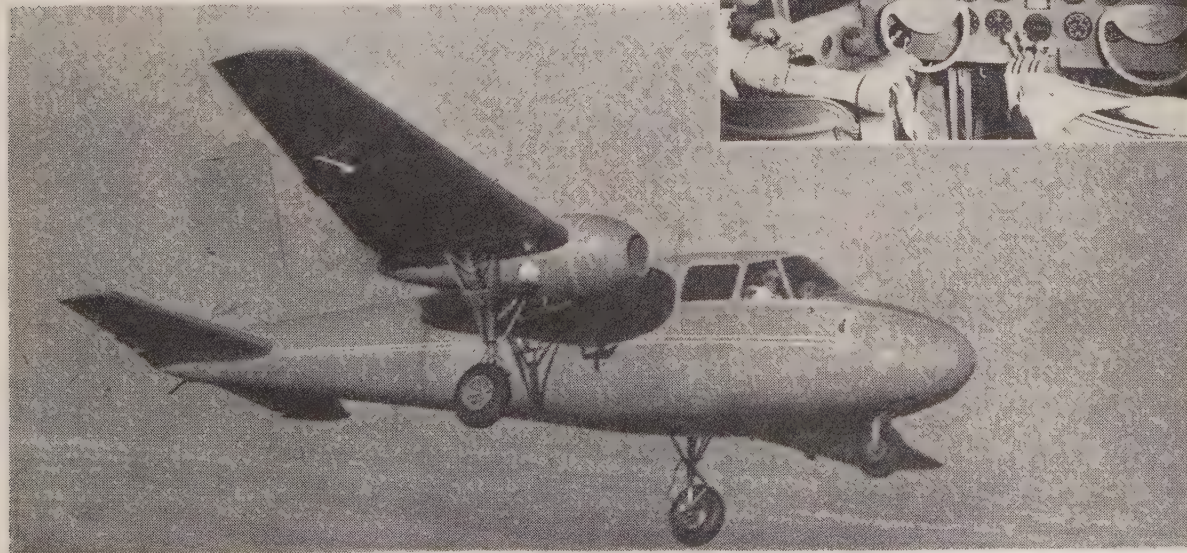
The Aero-Flight *Streak* is a two-place (tandem) all-metal airplane powered by 85-hp Continental. It has a top speed of 175 mph (at sea level),

landing speed of 52 mph, and a range of 700 miles.

The Baumann *Brigadier* is a five-place twin-engine pusher plane that boasts "automobile accessibility." The step from the ground to cabin floor is just 21 inches. Powered by two Continental 125's, the ship has a top speed of 170 mph, a cruising speed of 150 mph (65 per cent of power), and a landing speed of 57 mph. It will cruise at 100 mph on one engine.



**BAUMANN BRIGADIER**, another new one, is a five-place ship equipped with dual controls, retractable landing gear, etc.







**S**CREWBALL job? Yes, but I like it.

It's safe to fly under powerlines, profitable to gas your plane with the motor running and possible to jump 1,200-pound loads off 500-foot strips no wider than a driveway—"safe", that is, when you're flying a duster. For these "calculated risks," many a duster takes home over \$1,000 a month during the busy season.

I'd rather fly a duster than instruct students or ride the right seat on an airline, and I've done a little of all three. If I crack up a duster, I've only myself to blame, and the better-than-average pay makes it well worthwhile. Actually, flying a duster isn't the dangerous job that most people think. In dusting it's just as safe to fly two feet off the ground as two hundred, since in case of motor failure you're going to land straight ahead anyhow. Lightweight telephone lines will wreck a 65-hp plane, but my heavy surplus N3N ex-Navy trainer goes through them without even a shudder. And the fire hazard from spreading highly inflammable sulphur dust is minimized by metal tail surfaces and fuselage covering.

"The most dangerous part of dusting," according to Les Lackey who flies the mate to my N3N for Bob Norswing in Tulare, California, "comes

when you drive out to look over the property, checking for dangerous obstructions. You stand a chance of being bitten by the farmer's dog!"

Duster operations today make more money for pilots

**DUSTING PLANE**, a war-surplus N3N, has hopper which holds 1,200 pounds of dust. Pilot and his "swamper" can load a hopper with 900 pounds of dust and have ship back in the air in three minutes. Note tall exhaust pipe (below) to keep sparks from the dust

# BUZZ JOBS

By **BUD KIMBALL**

*As told to Don Downie*





# for HIRE

*Duster pilot points up  
in's of work . . . and out's*



**UP AND OVER**, the duster pilot puts plane in high-speed stall less than 20 feet above ground (center). Vibration of plane in this position unloads dust

than any other single branch of aviation, except possibly airline flying. In California alone 247 dusters are flying; servicing crops ranging from celery, broccoli, tomatoes, walnuts, watermelons, peas, cotton, potatoes, alfalfa to citrus groves. Dusters spread fertilizer, insecticide, defoliant to make cotton plants shed their leaves before harvesting, and then change hoppers to reseed sections of broad farm land.

Don't get the idea that dusting is an easy, get-rich-quick proposition. When you're flying a heavily laden duster with your landing gear hanging between the rows of cotton so that the slipstream will turn the leaves and dust them all over, making your first take-off from pint-sized fields so early



in the morning that your exhaust is still yellow-orange in the darkness, and shooting landings in a gusty crosswind on dirt roads 20-feet wide with dikes on both sides, you're earning your pay. Most duster pilots use cloth around wrists and ankles, heavy goggles and sometimes respirators to keep the irritating dust from burning their skin.

Today pilots with my general background, 1,400 hours in powerplanes and 600 hours in gliders, are a dime a dozen. After two and a half years instructing for the Army, I didn't want any more instruction work. I rode right seat on an Alaska bush airline for a few cold months, but could see no future in that either. Now, after flying a duster for the past year, I'm looking forward to a steady career of agricultural flying.

Before I started dusting for a living, I ran an advertisement in a magazine asking for a dusting job. One reply, on the back of a penny postcard from Florida, said that the writer had 3,400 hours and intimated that I was a young punk, a 90-day wonder with no respect for my wife and kids, and that I would be better off digging ditches. It was signed merely—"one-legged ex-crop duster."

A duster friend of mine who was in charge of operations for the late Tex Rankin, pointed out that I had a number of good qualifications if I wanted to dust for a living. I'd had a lot of Stearman time while teaching Army cadets. Also my soaring experience was valuable, since it included getting maximum performance at near-stalling speeds, comparable to flying an overloaded duster in tight turns close to the ground. I was old enough, 32, not to stick my neck out any more than necessary.

**CONVERTING** surplus Navy trainer, N3N, to a duster calls for installing 1,200-pound hopper. Note steel angle-iron construction of fuselage. Joints are riveted, not welded. Windshield is removed because they fog

And I didn't drink. That, too, was important.

My training period in duster flying was brief and to the point. I was given an Agriculture Department book on pests and their cure. I read and studied it. I got a short "chalk-talk" on the best patterns to fly. Then I worked as a "swamper" (ground crew assistant) for another pilot for a couple of days to get the correct ground procedure. I flew an N3N empty for two hours to get the feel of the plane without a windshield. Windshields fog with both dust and oil, and so are removed for better visibility. When you're flying with your shoulders, up from your arm pits, sticking out in the prop blast at 70 to 80 knots, it really takes your breath away, and flying like this in a rain squall is a bit rough on the skin, too.

With that background, I took "Nellie," the N3N, out on my first job. Mr. Lackey picked an easy cotton field with clear approaches and I took my first load with 400 pounds of sulphur in the hopper. As the days passed, I gradually worked up to a full 800 to 900 pounds. This year, they've made the hopper bigger, and I'll be able to pack 1,200 pounds for the larger fields.

I see no reason why a (Continued on page 44)





# Florida Weekend . . . by Air



**FLORIDA-BOUND**, the Harry Modells (right) traded winter winds for two days of Florida sunshine. They left N. Y. Friday, and were back in town Sunday night

**I**F SOMEONE were to offer you a trip to Florida for fishing in the Gulf Stream, swimming at Miami Beach, golfing on palm-fringed fairways, and a bit of nightclubbing—all to be accomplished over a two-day weekend—your first inclination might be to doubt the good sense of the donor, not because of the invitation but because of the suggestion that all that could be enjoyed within such a short time. But banish the thought that it cannot be done!

Mr. and Mrs. Harry Modell, a youthful pair of New Yorkers, took just such a flying trip and proved conclusively that not only could it all be accomplished in two days but that the two-day trip was more fun than many a longer (in time) one.







**FLORIDA** home for weekend was **Hotel Cadillac** where room off-season is \$8 per day, in season it's \$27



**FISHING** in the Gulf Stream called for being aboard boat 8:30 Saturday. Half day's fishing cost them \$35



**BIGGEST** catch was Mrs. Modell's 105 pound Marlin

The Modells left New York, via National Air Lines, late Friday afternoon and arrived in Miami 10 o'clock that same night. They checked in at an ocean-front hotel. The next morning they went sail-fishing in the Gulf Stream, and in the afternoon they flew, via Long Island Airways, to Lake Okeechobee for bass fishing. Back at Miami late Saturday afternoon, the Modells called it a day after dining and dancing at a nightclub.

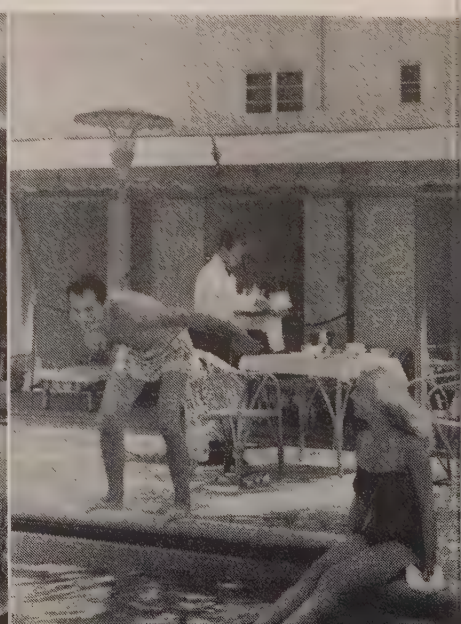
Early Sunday morning the two went swimming, followed that with a bit of sight-seeing, then topped it all off with a game of golf. At 6 o'clock Sunday evening, the Modells checked out of the hotel and checked in at NAL's terminal. They boarded a plane for New York, and arrived at midnight.

Those two days in Florida sunshine made the cold of the incoming winter easier to take, but more than that . . . they know now that two days of warm weather, swimming, etc., is never more than a few hours away, via airline, from anywhere. ✈✈

**FISHING** in Okeechobee was via Long Island Airways

**DAY'S END** found the couple dancing at a popular Miami night spot

**SUNDAY** morning early the Modells enjoyed a swim in hotel's pool







**SIGHT-SEEING** was on the docket after lunch on Sunday. Fortunately for Mr. Modell, all the gift shops were closed

**ROUND** of golf topped day for week-enders. Neither would say who won it



**SUNDAY** night, they checked in with NAL; were home at 12



# Skyborne SALESMAN

By NORMAN SELTZER

THE traveling man is a much maligned individual. Through the course of years he's been the butt of many a joke, borne the brunt of much abuse and has taken the farmer's daughter out of obscurity and given her a place in history. He follows a time-honored vocation. Historians record the traveling salesman as following the second oldest profession in the world. They can trace his origin from the biblical camel caravan right down through history. One of the first men off the Mayflower was a drummer. I believe he was hawking a line of feather dusters. With our forebears, he pushed westward with the covered wagon. He wasn't always discriminating. To turn an honest dollar he would as eagerly sell an Indian a scalping knife as he would a settler an axe. But always 2 per cent off for cash. Locomotion ever being a vital requirement, he progressed from the pack mule to the covered wagon to the locomotive, the automobile and now finally, the personal airplane.

I belong to this modern fraternity of traveling salesmen. I fly my personal airplane to call on trade. But I am a typical dyed-in-the-wool, blowed-in-the-glass traveling man. There is hardly a hotel, night track, riding academy or flophouse in the

middle west whose portals I haven't entered. I've pushed an animated tin-pot over countless miles of highway and have left my thumb prints on coffee mugs and juke boxes in just about every beannery that can pass a public health inspection. So pull up your rocking chairs, boys, while a fellow who is qualified tells you how to get out of the rut and onto the beam.

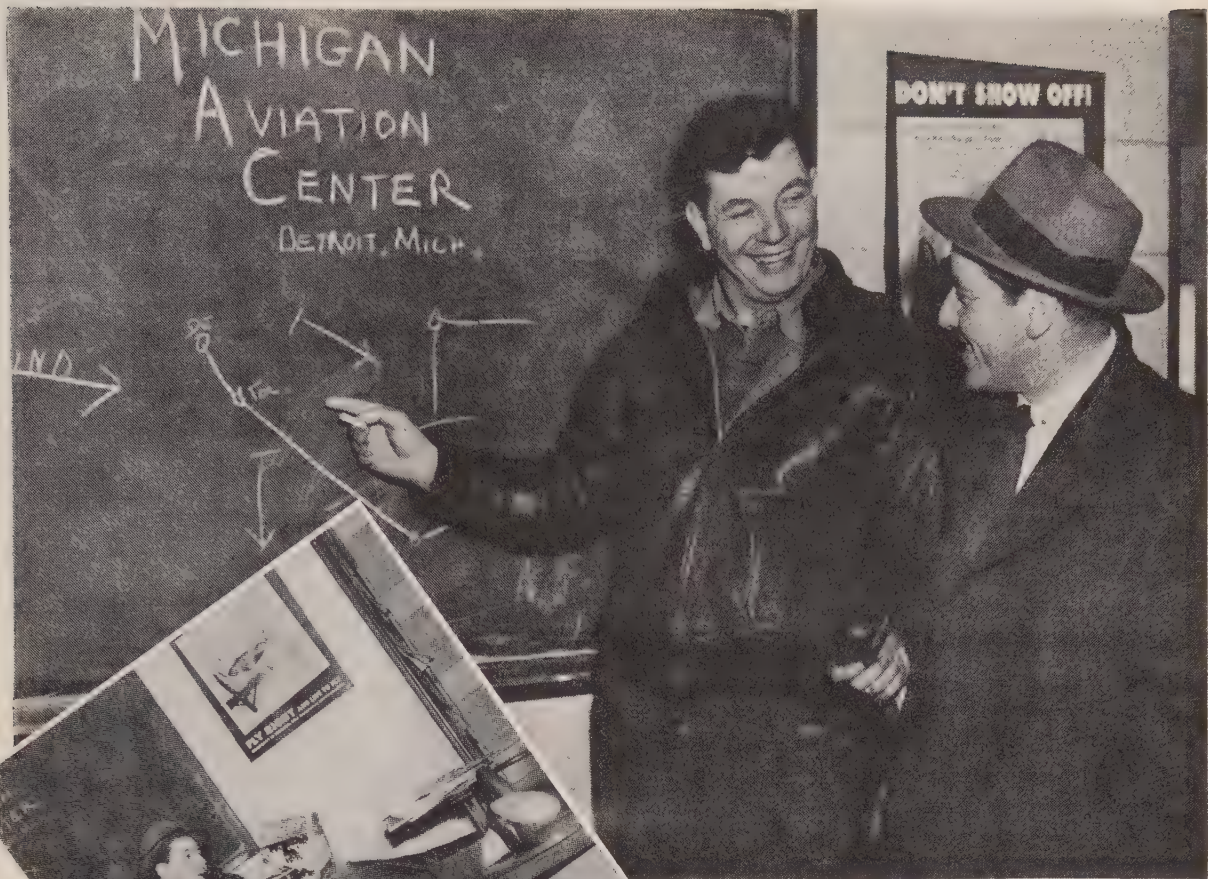
Personally, I am writing this in an attempt to preach enlightenment to my long-suffering brethren. I think I am eligible to do so since there is but a scant 150 hours of flying time that separates me from the time you, bug-eyed, will take your first hour of dual. And I am not going to make with a lot of technical hangar talk either, since I can't savvy that brand of lingo myself.

I first got the flying bug when I ran into a friend of mine, Pete Volid, in the lobby of the Detroit-Leland Hotel in Detroit. Pete represented a candy company out of Chicago. This was just before the war and he was already the proud possessor of a license and his own plane. By strange coincidence he was covering the same territory I was scheduled to make and I was invited to come along. I accepted, though I had my qualms—looking askance at the

**FLYING SALESMAN** Seltzer swapped ground travel for plane travel, thereby increased his calls and income







**INSTRUCTOR Tygert** (above, left) of Detroit started Seltzer on road to pilot's license

**TIME** lost because of weather isn't too much, but sometimes you have to sit out a storm

**PLANE**, as far as this salesman is concerned, means more time at home, more fun weekends



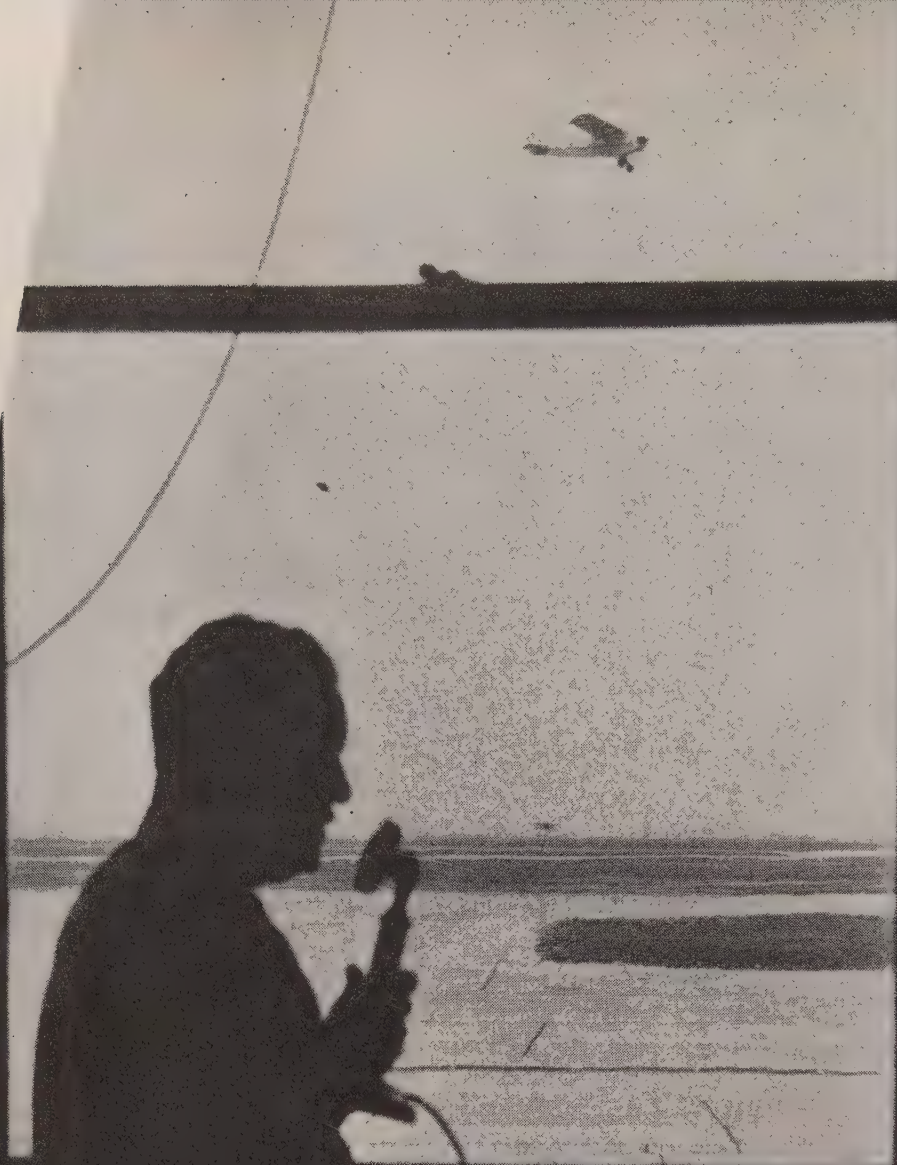
**FIELD MANAGERS**, in this case Doc McCracken of Fraser, welcome flying businessmen



250 pounds Pete weighed. That trip was the clincher. It was made quickly and smoothly and I had more fun than nailing the proverbial cat to the floor.

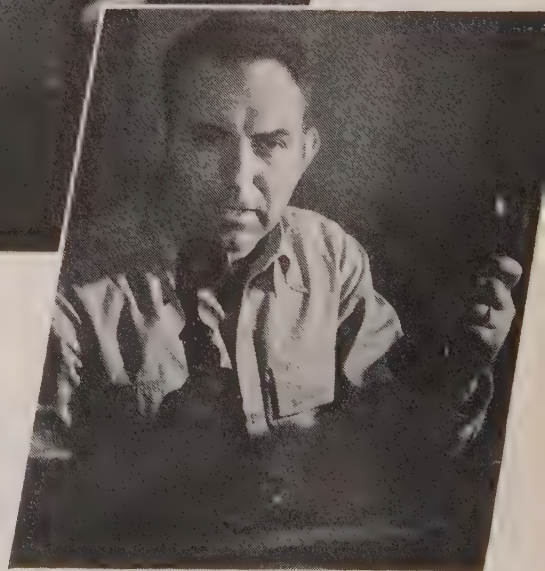
My mind made up, I contacted Lank Tygert, an instructor at the Detroit Airport. Now, Lank can put you through a series of simple maneuvers that will send you right out of this world. I don't deny that I envisioned with deep apprehension all the gruesome things that can pop into a student flyer's head. But now that I look back on it, I can safely say that it requires less courage to start flying than it does to stiff a headwaiter. (Continued on page 46)





**TOWER OPERATOR** is always busy. Don't hinder him, but help him by speaking slowly, enunciating clearly. Don't fill air with chit-chat

# *ON THE AIR*





If you guys and gals don't go as far back as I do, you have missed one of the greatest of America's institutions,—the old "party" telephone line. Those were the days when you listened to the ring to see if it was your number or someone else's. If it *was* your ring, you grabbed the receiver and started talking. As you chinned you heard various clicks and sounds that tipped you off to the fact that others were listening in, too. If it *wasn't* your ring, you were probably one of those other clicks yourself. Great stuff. Nothing like it—and many a romance as well as scandal began with a click in those days, literally.

Our modern two-way radiotelephone is the closest we come today to that old "party line." Because of the similarity, there are certain rules and courtesies that not only should (out of fair play) but *must* (out of regulation) be observed. This is particularly true when within "tower range." The poor Joes in the average airport tower have a tough enough time keeping things unsnarled without having a lot of needless chit-chat burning their ears. Let's see what "radio manners" mean—to you as a pilot.

First of all, let's look at your technique of handling the "mike" and earphones. If you could hear some of the garbled confusion that comes out of the control tower speakers, you'd realize there is a right and a gawdawful-wrong way to use a mike.

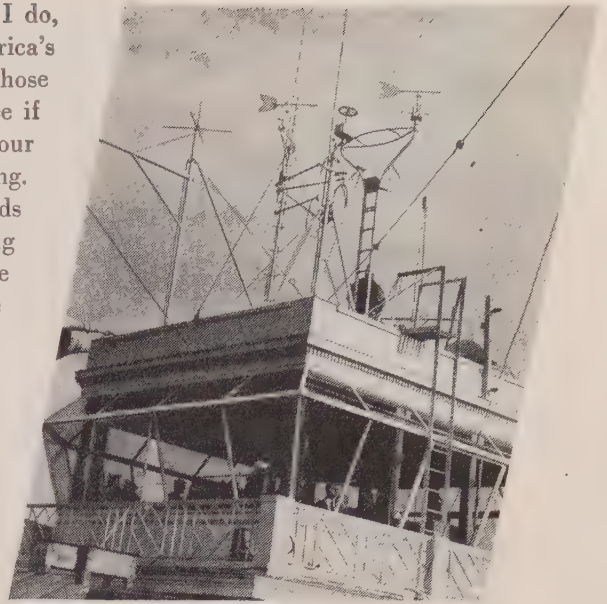
Very thorough tests have disproved the theory that you should use a normal tone in talking into a hand-held mike. You should talk as loudly as it is possible *without* straining or distorting your natural voice. Talk crisply, clearly and with a minimum of "er's" and "uh's"—and for heaven's sake don't copy the "Calling all cars . . . calling all cars. . . Car Nine bring home chops," sort of sing-song. That's adolescent and what's more it's lousy radio-telephone technique. Be business-like, concise, and do *not* include personal messages and remarks.

Talk directly into the mike—not across it—and your lips should be actually touching the unit. This is the position in which the voice is loudest and clearest and the proximity of the lips helps keep out outside noises which might interfere with the transmission. If you *must* turn your head while transmitting, turn the mike with it, keeping it in position close to the lips at all times (Continued on page 48)

By C. B. COLBY

**AIRCRAFT INTERPHONE** is strictly between instructor and student, but talk here also calls for good enunciation and clarity

**PLANE** equipment, particularly if ship is used for X-C, must include radio



**CONTROL TOWER** of an airport is the "brain" and directing "nerve" center of all plane operations. The operator's word is law





# Case of the

By GILBERT C. CLOSE

**PREVENTIVE** maintenance requires careful cleaning of all surfaces, metal or fabric. Pilot can repair wing walkway (left) with mastic





# CRIPPLED

# PIGEON

... "Shad Williams loved the old crate. And old she was—the OX-5 motor being a badge of her venerability. Years before, Shad had dubbed her 'The Crippled Pigeon.' It was an apt name. Viewed from a distance, she still resembled an airplane, but as you approached nearer, she resolved gradually into a junkpile of rusty baling wire, crudely-sewed canvas patches, warped wings, and grease-stained fabric surfaces.

"But the Crippled Pigeon could do one thing and do it well—she could fly! In 10 years, she'd never failed Shad once. Somehow, the OX-5 sputtering, she'd struggle into the air and stay there until Shad wanted to put her down." ...

**T**HUSLY the fiction writer gets off to a good start. And, damn, if at the controls of his typewriter, he doesn't put that pile of rags and rusty wire through a series of aerial maneuvers that would make a P-80 blush with shame.

It's sad that real-life flying won't fit this pattern. It's too bad when a "crudely sewed" patch rips off at a thousand feet and half of the airfoil fabric goes with it. It takes more than a dozen strokes of a typewriter's keys to get a pilot out of that jackpot.

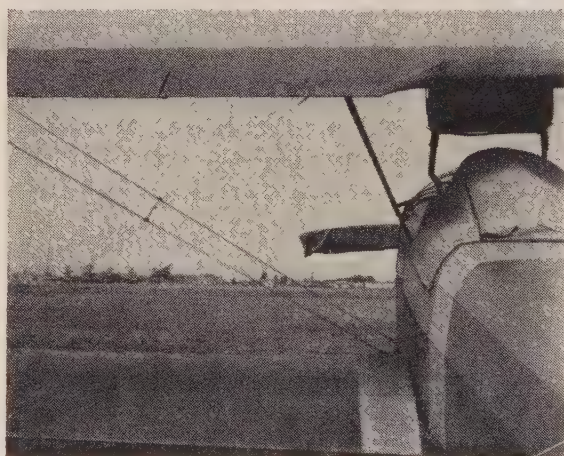
One of the saddest experiences at a lightplane airport is to walk down the line of staked-out airplanes, glance at each, and note the dozens of little jobs that each pilot could do to increase his safety, save himself money, and prolong the life of his airplane. Punctured fabric, ringwormed dope, loose surfaces, rusty bolts, corroded connections, dirt-filled engine baffles—one or more such defects noticeable on nearly every airplane. And when you come to the airplane with all such defects visible, you'll probably find the pilot disassembling the wing generator just to see what makes it work.

The average pilot likes to tinker with his plane. His fingers itch to do something, to take something apart and to put it together again. With a bit of intelligent forethought and by careful observation, he can find plenty to do. He can lay out a plan of preventive maintenance that, in the long run, will pay him large dividends for the time involved.

Preventive maintenance and line inspection should not be confused. Line inspection is to determine the airworthiness of the airplane, but during line inspection small defects that in no way affect current airworthiness can be noted and referenced for future attention. This is preventive maintenance at its best. The defect that can be corrected with little effort today may run into a costly plane-repair bill later.

Such a plan of preventive maintenance, well executed, will result in four definite advantages:—all parts of the airplane will be maintained at full strength, reducing the possibility of failure; the service life of all parts will be materially increased; repair and replacement costs will be reduced; and both preflight and periodic inspection will be facilitated by cleanliness and the absence of defects that might cause some doubt. These advantages are far more material than the self-satisfaction of disassembling a gyro-compass just to see "what makes the wheels go 'round."

Few pilots are much concerned with the metal parts of their airplane. They have learned to regard metallic structures as something indestructible and permanent, with an indefinite and always more than

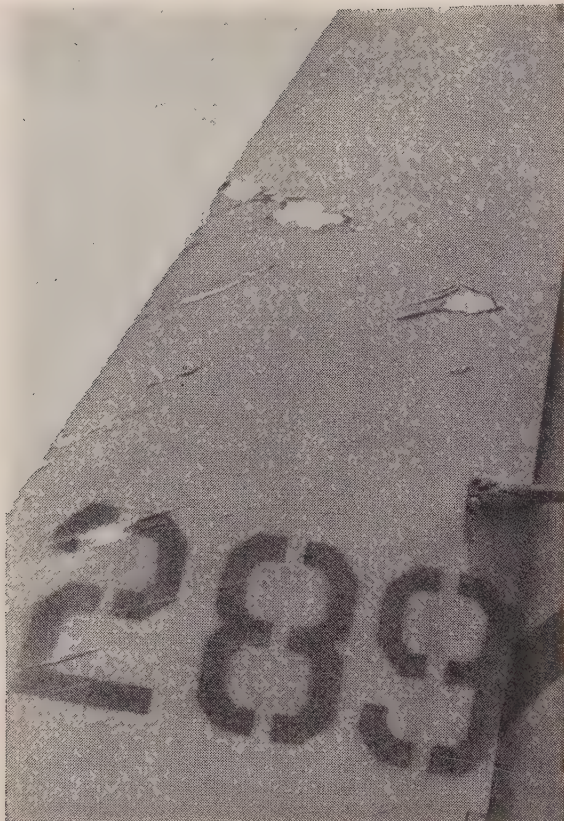


**PLANES left out and unprotected require repair often-er. This one needs redoping of its scabby upper wing**

required service life. This is true of a lot of machines, but not of an airplane where each metal part is designed to minimum strength requirements in order to save weight. Metal aircraft parts just won't stand a great deal of weakening, and when this happens something costly if not disastrous is liable to occur.

The two enemies of metal, aside from normal wear, are corrosion and mechanical injury. Of the two, corrosion is by far the more insidious and common of the two. Corrosion is a slow burning process with a chemical fire sapping the heart and strength of the metal being attacked. It's one of the pilot's worst enemies. There are thousands of accident reports now on file wherein the complicated terminology under "Cause" should have been crossed





**NEGLECT** has forced owner of this plane to recover ship. Doped surfaces should have been redoped earlier

**TEARS** in fabric should be fixed immediately. Edges of tears are pinked, smoothed, then a patch doped on



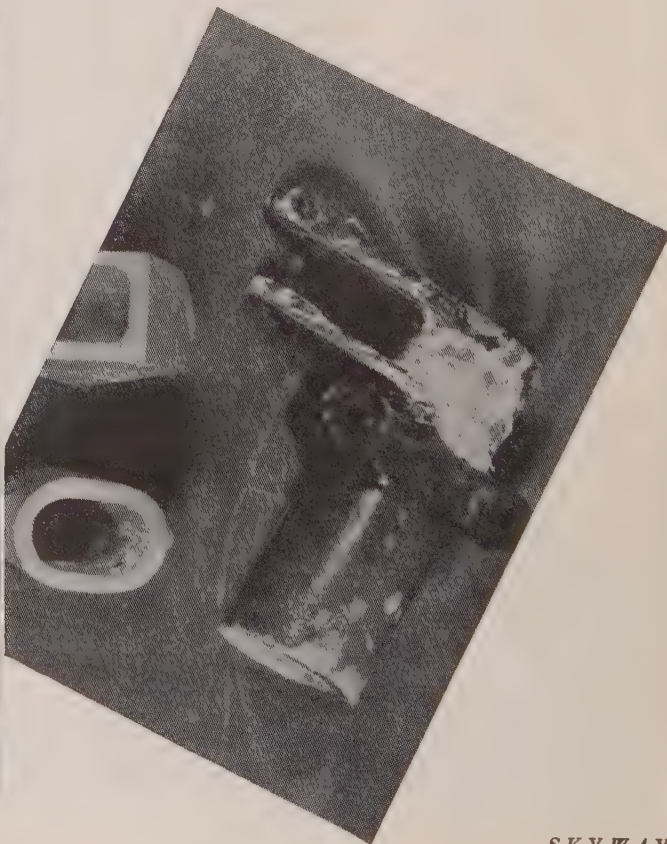
out and the simple word "Corrosion" written in.

Jim Dublinsky came in one day—in a flat spin. That landing cost him his airplane and two months in the hospital. His accident report, now on file, reads, "Jammed rudder control." But that's only part of the story. The truth is that the rear bellcrank on the rudder control cable, located near a grommet, had become badly corroded. Oxides, gathering on its surface, had caused it to become oversize. When Jim attempted an exceptionally tight maneuver, using more rudder than he had used for months, the oversize bellcrank couldn't clear a structural member. Result? It jammed tight against the side of the member and Jim came down.

The above accident is illustrative of two common errors. First, the controls hadn't been tested to limits during preflight inspection, and secondly Dublinsky had been ignoring for a considerable time those hard-to-get-at components which are vital to safe flight. Had he looked them over occasionally, he would have noted the corroded bellcrank and cleaned away the oxide build-up.

Common atmospheric moisture is the most corrosive substance with which the average airplane has to cope. Furthermore, airplanes are subjected to moisture conditions even though the sky is clear. When returning from the cool of altitude to the warmer ground re- (Continued on page 50)

**CORROSION** of airplane parts has caused many an accident. Corroded parts should always be replaced





# Nix on the LANDING BOUNCE

**P**ERFECTED to the point that a solid rubber tire can be used to land light aircraft, a landing strut invented by Lucian R. Gruss, ex-Wright Field engineer, will make its appearance soon.

Employing an air-oil combination, the action of the strut takes the "bounce" out of landing and substitutes the sought-after gliding effect. Gruss, the inventor of the conventional strut for airplanes, has organized the L. C. N. Corporation of Middletown, Ohio, where the strut will be manufactured.

One of the principal features of the new strut, called the L. C. N. Landing Strut, is the automatic maintenance of air pressure in the taxiing cylinder. No schrader valve is required on the smaller struts because air is drawn through a one-way, non-leakable valve to the space under the piston during the compression stroke. On the extension or take-off stroke, air is forced through a similar valve in the piston to the space above the piston. Theoretically, air above and below the piston has been determined and after five or six strokes of the piston, the air pressure, when the piston is in extended position, becomes equal and no further admission of atmospheric air is possible since the admission valve is held closed by the pressure of the air within.

L. C. N. struts are pumped up prior to delivery and if for some reason the air pressure is released, all that is required to bring the pressure up is to rock the plane a few times. For larger planes, those weighing more than 4,000 pounds, a schrader valve has been installed for increasing the pressure with a pump. The valve may be sealed for an indefinite time because the pressure will be maintained auto-


atically during the plane's take-off and landing.

Should any of the oil leak past the main piston, it is contained in the space below the piston and, at the first extending stroke, is forced back through the air valve in the piston to its original space above the piston. All struts are guaranteed against loss of oil by leakage for six months and are designed to eliminate servicing for a period of one year.

Of utmost interest to lightplane manufacturers is the shock-absorbing qualities of the strut. In the past, sturdier construction has been essential—primarily because the shock of landing the plane was great. The new strut and the structural parts to which it is attached may be lighter without reducing safety.

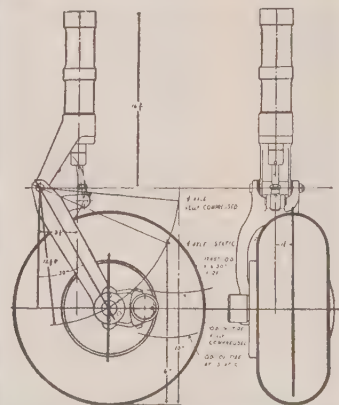
One of the primary reasons so much of the shock is eliminated is the landing ram, developed by the inventor during experiments at Wright Field. The landing ram extends from the strut and is forced into an oil-field tube when the plane is landed. The initial pressure on the oil is very great and a large part of the landing shock is absorbed because of the compressibility of oil. The landing ram absorbs most of the initial landing shock, transferring less to the upper structure of the plane.

Of military value is the outside sliding tube protecting the ram tube. The outer tube could be punctured and yet not harm the taxiing or landing energy tube, allowing the pilot to bring his plane to a safe landing. The ram tube is separated from the taxiing cylinder and both would have to be badly damaged to prohibit landing.

The I. C. N. Corporation expects to start installing struts on both light and heavy aircraft. 

## By CHAL ADAMS

**LCN STRUT** is shown in three positions: fully extended (left) as in air; fully compressed (center) on touching down; and in neutral, bearing plane weight





# 400,000 PERSONAL

**T. P. Wright, Civil Aeronautics Administrator, confirms original forecast made two years ago**

**By T. P. WRIGHT**

*Article taken from a paper presented by Mr. Wright at Anglo-American Conference in London*

**T**WO years ago, in May, 1945, to be exact, I ventured a forecast that by 1955 there would be 400,000 registered civil aircraft in the United States. I further stated we would have an annual personal-aircraft production of 150,000. Now, to-day, I see no reason to change that estimate.

At the time of the original pronouncement of those figures, I submitted a four-point program which I considered necessary to assure our reaching

that goal of 400,000 planes. Those four points were:

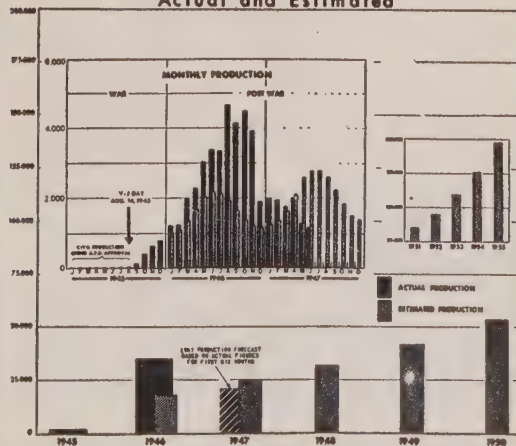
1. Expansion of the airport system.
2. Re-appraisal of regulatory requirements.
3. Institution of educational and training aids.
4. Acceleration in technical development of the personal plane itself.

Progress is being made in the first three points: a definite start has been made in a national airport program; private-pilot and personal-aircraft regulations are being rationalized; and educational programs, including the large-scale plan of training under the G.I. Bill of Rights, are being instituted.

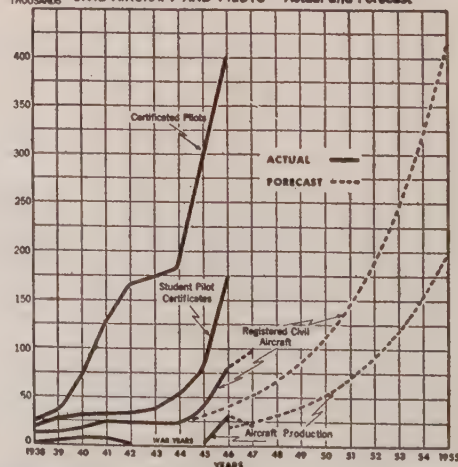
There remains one item to be concerned with, however, and that one . . . the improvement along utility lines of the aircraft itself. The need is great there and we must continue to concentrate our efforts in that direction. Personal planes being built today do not have sufficient over-all merit to warrant the market forecast for 1955. This may be due, in part, to the fact that the 1946 personal-plane market favored the production of two-place planes suitable for training, thus minimizing the importance of concentrating development efforts on a proper family-sized aircraft. Actually, over one-third of all planes manufactured in 1946 were sold for training purposes.

In improving the utility of personal aircraft, de-

**CIVIL AIRCRAFT PRODUCTION  
Actual and Estimated**



**THOUSANDS CIVIL AIRCRAFT AND PILOTS — Actual and Forecast**





# AIRCRAFT BY 1955

velopment efforts *must* be concentrated on the four-place or family plane. The buying trend is definitely in the direction of four-place planes, as illustrated by the curves on the chart (*below, left*) which represents the two-place plane as against the three or four-place plane. It will be noted that in 1946 the two-place plane predominated by a substantial amount, but that the curves crossed at the end of the year, with substantially the same sales this summer. Although in term of airframe weight (*below, right*) the importance of four-place plane market is shown to be greater than the two-place.

Also involved in plane size is comfort, where adequate space, including that for luggage, is necessary in order to satisfy purchasers.

Under the heading of performance, the cruising speed of the personal plane must be 150 mph. This is sufficient to allow for adverse winds and still grant a margin of speed compared to cross-country automobile travel of from three to five times. Any speeds which could be achieved in excess of 150 mph should be sacrificed in favor of improving other characteristics which call for design compromises with speed.

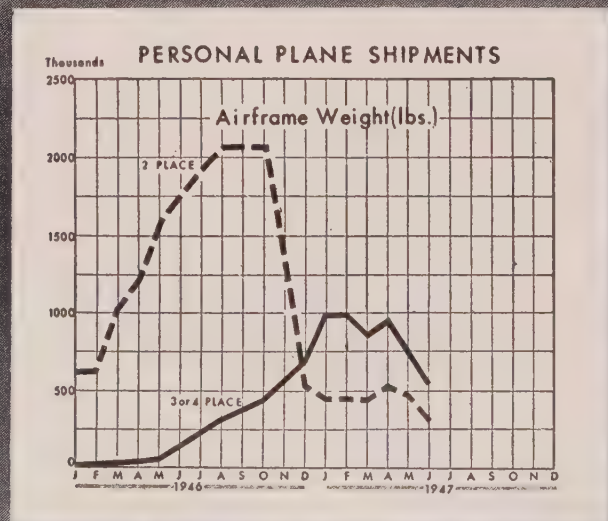
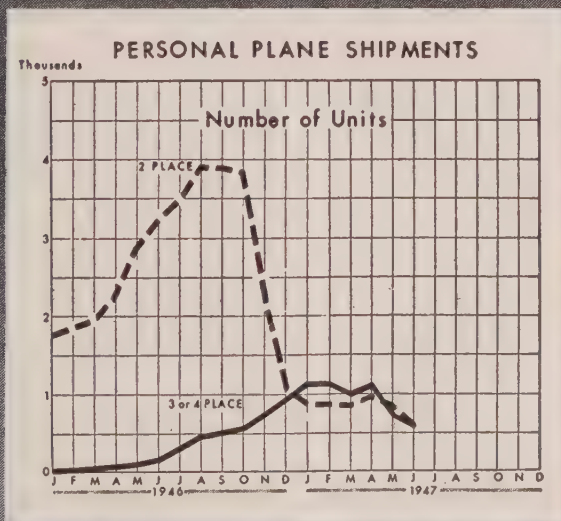
After adequate cruising speed has been attained, other items such as decreased take-off distance, increased rate of climb, and lowered landing speed



**T. P. WRIGHT**, chief executive  
in field of civil aeronautics

should be improved to the maximum. Lowered landing speed, in fact, is one of the most essential from the standpoint of ease of flight, training-time reduction and safety. I would like to see the family plane with a stalling speed of 45 mph, thus allowing a landing speed of 40 mph.

The crosswind landing gear is another feature of tremendous importance. This type of landing gear, which has been of great (Continued on page 53)





# Instrument Know-How

**TURN-AND-BANK** tells you whether plane is turning or flying straight and level; tells you if your skidding in turn

**AIRSPEED INDICATOR** is controlled by elevators. Pull back on stick, airspeed drops off. Push forward on stick, your plane's airspeed picks up

**TACHOMETER** measures engine's power output. Cut the throttle, rpm's decrease; increase the throttle and the engine's rpm's increase

**ALTIMETER**, controlled by the throttle, registers plane's altitude. Advance throttle, your plane gains altitude; retard it, and your plane loses altitude

**Y**OU FLY a small plane. One day when you are flying about your local area, practicing 8's or Chandelles, or just cruising aimlessly, you say to yourself,

"For gosh sakes, I'm bored. Maybe I need to get into a larger ship!"

You think about this more and more, and the idea gets a firm grip on you. You look around at the larger ships, and perhaps you decide to settle on a *Bonanza* or a *Navion* or any other fully instrumented ship. Trouble enters. You take a peek at your "federal reserve" and find that it will be a



# ARTIFICIAL HORIZON

ARTIFICIAL HORIZON shows attitude of your ship. It is necessary in instrument flying to indicate climbing, gliding, etc.



while yet before you can save enough cash to get a bigger plane. Meanwhile, what are you going to do?

Why not have fun with your small plane and, at the same time, get ready for the larger one. Grow up with your instruments and while you are discovering them, you will find that boredom for you is a thing of the past.

In learning how to control your instruments you will spend many an interesting hour; and when you step into that *Bonanza* or *Navion* you won't feel as though you have stepped into a rocket well on its way to Mars. Your practice in the small plane will make the step up to a bigger ship easier.

The faster or larger the ship, the more necessary becomes a knowledge of instruments. Take a look at your instrument panel—you'll find an *altimeter*, which is by no means sensitive, indicating your altitude in hundreds of feet; an *airspeed indicator*, keeping track of your forward speed through the air; a *tachometer*, giving the revolutions per minute of your engine; a *ball-bank indicator*, which tells you if your ship is properly banked for the maneuver you're doing; a *compass*, to give your direction; and an *oil pressure gauge*, giving the pressure of your engine oil. Strapped to your wrist will be a watch. If not, it's a good idea to get one, for time is an all-important element in flying by instruments.

You no doubt have been accustomed to giving these instruments just a cursory glance. But now is the time to be different—get into the habit of *reading* your instruments. Glance at your panel as you turn your head from side to side, on the lookout for other planes. Keep a constant check, so that at any moment you can say:

"I took off at 10:00. Time now is 10:20; altimeter reads 2,000 feet; airspeed, 70 mph; tachometer at cruising speed, 2100 rpm; ball is centered; heading, 180 degrees."

Maybe it sounds like too much bother but, believe me, it isn't. Instrument flying takes constant checking and correcting. You must realize too, that no *one* instrument should be watched to the exclusion of the others. Each one is important.

Remembering that, let's take one instrument at a time and find out how it is controlled. The information given here will not by any means cover *all* there is to know about these instruments, but it will cover some of the more necessary knowledge.

First is the *altimeter*. This is controlled by the throttle. A beginner pilot may roll through the air

like a roller coaster but, when you pile up enough hours to move on to a larger ship, it's time you began holding your altitude on an even keel.

Take your plane up to 2,000 feet. This will give you a good reference point. Now with the indicator on 2,000 feet try keeping it there.

If it creeps a little above 2,000 feet, close your throttle a bit until the needle again is on the point. If you find you're losing 50 feet, advance the throttle slightly. Now keep your plane at that established 2,000 feet.

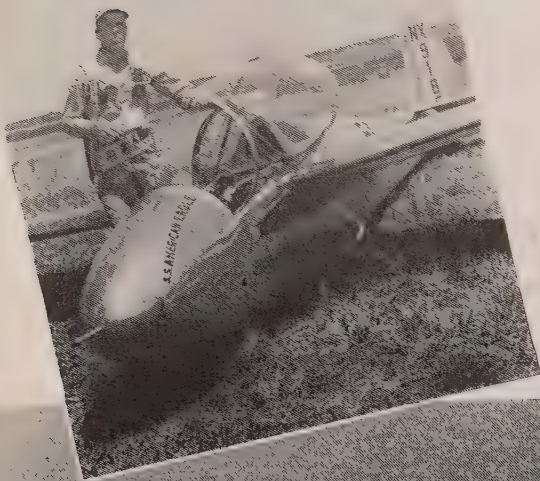
Since only slight movements of the throttle will be necessary, the best method of adjusting it will be to rest your hand on the throttle quadrant with fingers around one side and thumb on the other. Thus you are not inclined to move the throttle too far.

Now look over at your *airspeed indicator*. This is controlled by the stick (elevators). Let's assume you are at cruising airspeed or approximately 70 mph. Pull back on the stick and notice that your airspeed drops off. Push forward on the stick and watch your airspeed pick up. As you read the instrument, visualize the attitude of the ship. Is the nose up or down?

Try to keep your airspeed at cruising. You will find that all you are doing (Continued on page 56)

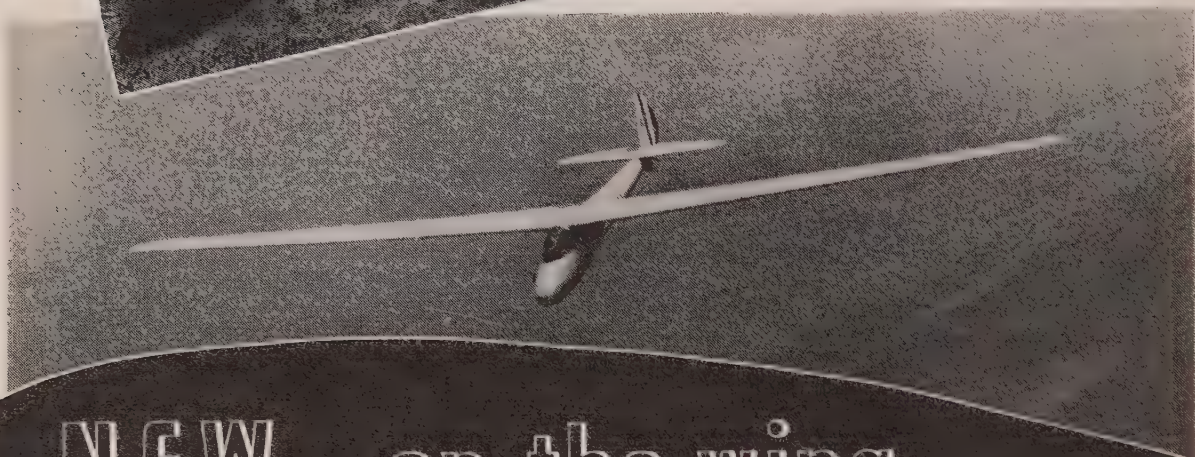
By WIN WOOD



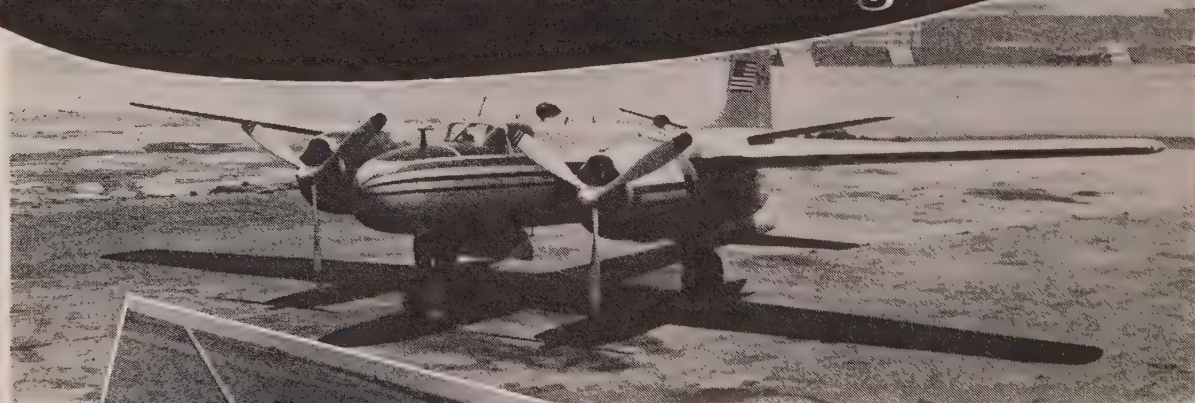


**SCHWEIZER SGS 1-21** is a new experimental sailplane. This all-metal glider, shown here with ace glider pilot Richard J. Comey of Cambridge, Mass., carries 15 gallons of water ballast in each wing. This can be dumped at a moment's notice. Comey recently won soaring contest in SGS

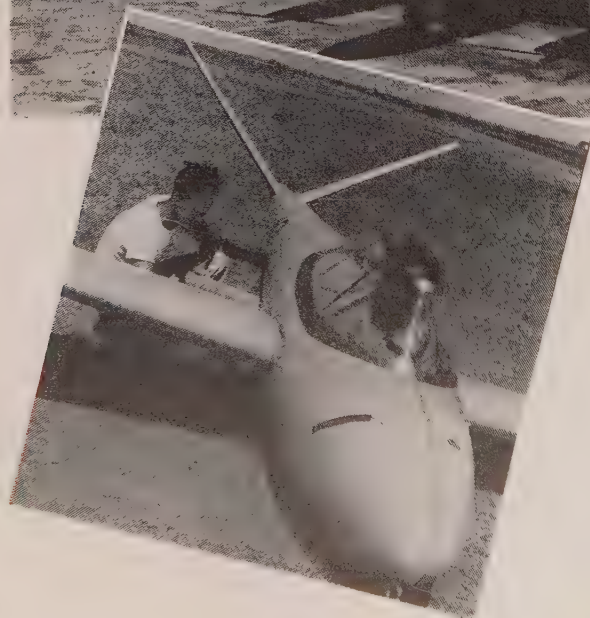
**ITALIAN KANGAROO** is another new glider. This one, a two-seater, has been test flown by many of the continent's best glider pilots and has been referred to by them as "the last word." Detailed specifications and performance figures of the *Kangaroo* have not been released yet



## NEW... on the wing



**LOCKHEED A-26** attack bombers today are being converted to executive-type transports. This one, converted for Superior Oil Co., seats five, has a cruising speed of over 300 mph, and an operating radius of 2,500 miles. Another is being converted for the Stanolind Oil & Gas Co.



**PRUE 160** is one of the most unusual sailplanes seen at recent glider meets around country. This one was made from a P-38 belly tank, and features a "butterfly" or V-tail similar to that on the Beech *Bonanza*. The Prue 160 has wing spread of 36 feet and it weighs 250 pounds





**LUSCOMBE SILVAIRE** is not a new airplane but this is one of the latest model *Silvaires* to be equipped with floats. The ship is powered by 85-hp Continental engine, has a top speed of 125 mph, a range of 600 miles. Addition of floats does not appreciably change performance

**CUNLIFFE-OWEN CONCORDIA** is a new British airliner. Of all-metal construction, it was designed for feeder-line operation. Powered by 505-hp Alvis Leonides engines, it cruises at 190 mph with 10 passengers and full baggage. The *Concordia* has a range of about 1,200 miles







R. Osborn

"How Dilbert's faxing looks to everyone . . . but Dilbert"



# DILBERT



By S. H. Warner and Robert C. Osborn

## TAXI TIPS

**Taxi Tips**—Let's have a look at the record before we start taxiing. According to the CAB, taxi accidents are third in frequency. But they are way out in front by a wide margin in "carelessness." You



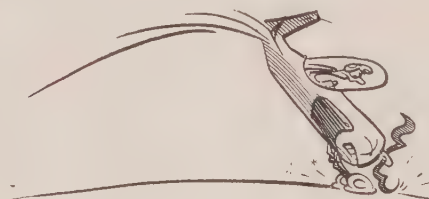
can go right down the line and find that most of them are due simply to neglect of reasonable precautions either through the outgrowth of bad habits or a lapse of safety consciousness. Either way you end up in the same pile. What an unnecessary waste!

Automobiles may be hard to fly but they are easy to maneuver on the ground. With airplanes it is just the reverse. On the ground they tend to nose over, to tip over, to weathercock and groundloop, besides being blind as a bat up ahead. As long as you remain aware of these dangers, they aren't dangers. You become accident prone in direct proportion to your amount of awareness.

Control surfaces are designed for maximum effi-

are more effective than the ailerons in taxiing. Some pilots ignore the latter entirely, but they are of some value as will be explained.

Naturally, brakes and steerable tail wheels simplify taxiing, but since these controls have been known to fail and since not all planes are so equipped, every pilot should know how to taxi without their help. The main thing to remember about brakes is never to get yourself in a position where you have to apply them so suddenly as to nose up. Propellers and engines dislike sudden stoppages.



Also remember brakes lose their effectiveness on wet surfaces; water, snow, ice. A brake drum filled with water during take-off may freeze in the air and lock the wheel, with unfortunate . . . most unfortunate . . . consequences on your next landing.



ciency when flying. Notice how much greater movement they require at low speeds. Since the rudder and flippers are in the propeller slipstream, they



Taxi at reasonable speed at all times. In restricted areas and at the start of turns, this means 2 or 3 mph. Always it means that the (Continued on page 58)



# Buzz Jobs for Hire

(Continued from page 24)

conservative duster pilot can't live to collect on his old age security payments. I feel that it's safer many times to fly under wires rather than over them. It is difficult to tell just where to start a pull-up with a heavy load and still have enough potential energy to get into the nearest open field should the motor cut out, and I'd rather knock down a fence anytime than a high tension line. At Los Banos, California, last summer, I knocked down the same telephone line three times one morning. Then the next day I rolled my wheels through a 440-volt power line and saw a bright flash at the poles as it broke. My immediate worry was that some farm hand might be electrocuted as the wire lay sputtering on the ground. Hitting that high tension line was all my fault. I had too much carburetor heat, wheels in the cotton tops, and additional hundred pounds of dust in the load and hadn't surveyed the field properly from the ground. The only damage to "Nellie" was a small nick in one propeller blade.

The insurance rates on duster pilots are the highest of any job in the world, including deep-sea diving. My employer pays \$14 on each \$100 I earn on a \$7,000 compensation insurance policy. My best insurance, however, is a \$10,000 G.I. policy. We also carry insurance for injury to crops from drifting dust, torn-down telephone lines and injury to farmhands working on the fields.

The N3N is my personal choice in dusters because of its faultless flying characteristics, ample stall warnings, load carrying ability and safe structure. The N3N has both metal spars and ribs that will really take a beating. A pilot I know, flying his first season in a duster, hit a four-inch metal standpipe with the tip of his lower wing. It would have torn any lighter construction to pieces, but his N3N kept right on flying. Later this duster was flown 60 miles to Tulare to have the lower panel, badly sprung by the collision, replaced. The standpipe, part of an underground irrigation system sunk in concrete, was completely uprooted by the impact.

Many of the surplus trainers make fine dusters. Lloyd Stearman, from whom the Stearman trainer took its name, is making a duster at Inland Aviation at Los Banos, California. A 450-hp engine and propeller from a basic trainer is installed in the nose of these Stearman's. The ship is called an Inland-Boeing 75-A, and will get a load of 1,250 pounds into the air with a roll of less than 500 feet. This ship has an electric starter, beautifully designed hoppers and venturis that will spread dust in a swath wider than the wing-tips. One pilot in Northern California is even converting a twin-engined Cessna into a rice-planting rig.

Our surplus N3N's are cheap and relatively easy to convert to dusters. A pilot-owner can show enough profit in a month of steady flying to pay for a complete airplane, conversion work and all. Both prices charged and quantity of dust spread per acre vary in different sections of the country. An average price in Central California is 4¢ to 5¢ per pound for spreading dust. The farmer pays for the dust plus the application charges.

Duster pilots always survey each job from the ground before flight. That's the only way

they can see all the standpipes, guy wires, high irrigation ditches covered with tall grass, and fences to be dodged. Since the first flight of the day is made at dawn, there is little chance of seeing all these obstructions, and the pilot should have the field completely memorized before he does the job. Early morning flights are a must since the defoliating dust won't stick to leaves that have no moisture on them. The warm, unstable air of late morning rises and takes the light dust up with it and little if any reaches the plants. This dust is so fine that it will pass through a 400-mesh screen that water won't penetrate. Should the pilot be spreading sulphur to kill red spiders in cotton plants, he has another good reason for quitting work early. Any temperature above 80°F makes sulphur dust highly inflammable. We quit for the day when the temperature reaches 70°F. I average less than three hours a day in the air during the busy season.

Seeding, planting rice and spreading fertilizer are relatively high-altitude operations for a duster pilot. Then we fly at about 50 feet, just over the tops of the telephone poles. Another advantage of seeding, ricing and spreading fertilizer is that you can fly all day if you wish. Neither heat nor moisture affect the cargo to be spread.

Strangely enough, the only place to gain time while dusting is on the ground. When you have only two hours suitable for dusting each morning, time saved is money in the pilot's pocket. You can't save any time while flying across a field putting out dust, and it is considered poor policy to try to cut corners by turning too close to the ground. So preflight planning and fast loading are the only time savers. A well-planned schedule, strict routine for loading, a complete survey of the job beforehand, and a good "swamper" save precious minutes. I can load 800 pounds aboard and be off the ground in three minutes flat. Since old "Nellie" has no starter, the one load of gas I need each morning is pumped from our pickup truck directly into the special fuselage tank without shutting off the engine. There is little danger of fire since the high-overhead exhaust stack keeps all flame away from the fuel. To my knowledge, no one in our area has yet burned up a duster by this type of refueling. When inexperienced "swampers" don't know how to handle either the switches or the prop, this radical type of gassing is well justified, since the 30 minutes saved in re-starting a hot, balky engine makes the difference between

profit and loss for the day's operation.

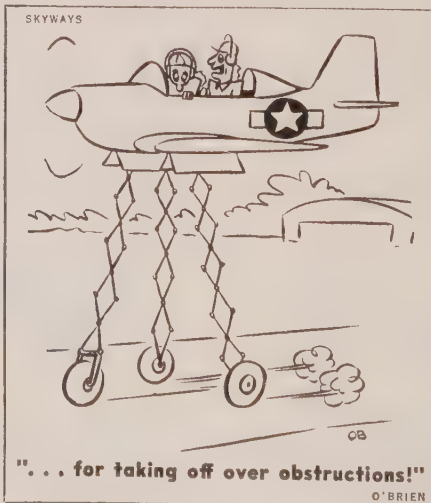
Getting dust into tight corners of fields bounded by high-tension lines or trees keeps a duster pilot on his toes. Usually a high-speed stall out of a climbing turn, all at about 20 feet above the ground, will unload enough dust to cover completely the corner. As the plane shudders in the stall, the hopper unloads dust very rapidly.

One day I asked my boss just how close it was safe to get to obstructions. When he saw that I was a little apprehensive about close-in flying, he advised me to pick out a weeping willow tree with no large branches near the top and then try to nudge it with a wing-tip, just for practice. I found a likely-looking cottonwood tree a few days later and made over a dozen passes at it without ever touching the tree. Eddies from the wing tips would make the leaves sway, but that was all. Only once since then have I actually touched a tree; I brushed an olive tree with a wing tip, but it looked as though I were going to fly right through the tree! Some of the older duster pilots tell stories of sinking so deep into an orange grove that the oranges roll back over the top of the lower wing, and still being able to fly back out. But to me they're still only stories.

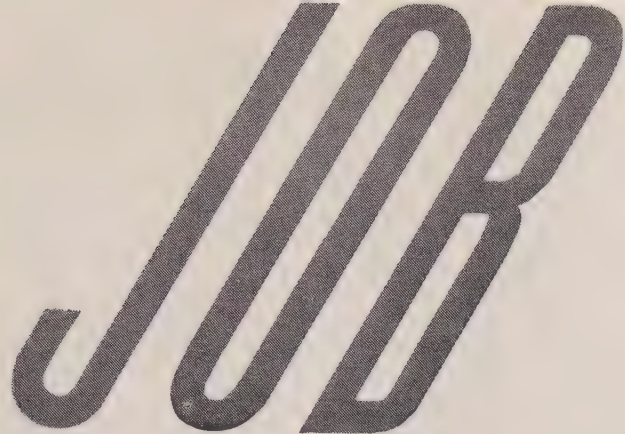
Dusting is still an art and not a science. Each pilot handles his plane as he sees fit and there are no cut-and-dried rules to follow. CAA inspectors never give a working duster pilot any trouble, since they understand that low flying is essential to a good job, but when I have an early morning job on the fringe of a town, I usually call the local Chief of Police the night before and tell him that I'm going to work near town.

The average summer day in the life of a duster pilot begins at about 3 AM. We generally eat and get to the field by 4 AM. The "swamper" goes to John Doe's strip with a pick-up truck carrying a gas drum and hand pump. Then the duster is warmed up and we take off in complete darkness so that we'll arrive over the strip just as soon as it is light enough to see the field. After the first hopper is emptied, the pilot must help load the plane. A good crew can load 900 pounds of dust, shaken from 50-pound paper sacks, and have the ship flying in less than three minutes. When the morning flying is done, we usually get back to the home field by about 7 AM, tired, dusty and hungry. Then old "Nellie" is washed down. One-hundred pounds of dust can collect in the tail of a plane in less than a week if it isn't cleaned regularly. After a shower and breakfast, I try to get a couple of hours' sleep and then go out in the truck to line up the next day's flying and check the farmers that have been serviced that day. I drive about 100 miles a day during the busy season, and get home about dark when there is no evening flying. After supper, I head for bed. There is no night life for a conservative duster pilot during the rush season.

Dusting is dirty, physically hard work and potentially hazardous. It is interesting because it presents a constant challenge to the pilot and requires complete mastery of the aircraft. I learn something new about flying every time I climb into a duster. The work is seasonal, but the 20 to 25 per cent share of the gross income that goes to the pilot is very satisfactory. I can make enough in a short season's dusting to go out to the desert and fly sailplanes, just for the fun of it, the rest of the year. That's why I like it.







# Opportunities in AVIATION



**T**HERE are hundreds of job opportunities in aviation. A recent *SKYWAYS*' survey showed that there are 85,000 men and women employed in the airline industry alone! To insure *YOUR* future in aviation, read the December and January issues of *SKYWAYS*. These two issues will list the job opportunities in aviation, the qualifications necessary, the rates of pay and plans of advancement. Choose the job you want and then plan your training accordingly. *EX-GI's*, remember . . . most of you can get your training *FREE* at the CAA and Veterans' Administration-approved schools.

## Ground Jobs—December Issue

### A—Airlines

Reservations  
Traffic  
Sales  
Management  
Operations  
Meteorology  
Tower control  
A and E mechanics  
Instruments  
Propellers  
Radio—Communications  
Radio—Maintenance  
Airport Engineers

### B—Aircraft, Engine, Accessory Manufacturers

Office Personnel—non-technical  
Managerial  
Personnel  
Cost  
Accounting  
Pay roll  
Purchasing  
Clerical  
Stores

Secretarial  
Engineering Personnel  
Draftsmen  
Engineers—all types  
Stress analysts  
Chemists  
Metallurgists  
Tool designers  
Stock  
Shop Workers  
Sheet metal  
Machine shop  
Assembling  
Pattern making  
Welding  
Wood workers  
Heat treating

### C—Private flying

Management  
Sales  
Mechanics  
Linemen

### D—Related Occupations

Advertising  
Insurance  
Public Relations  
Research

## Flight Jobs—January Issue

### A—Airlines

Pilots—all types  
Flight engineers  
Radio operators  
Navigators  
Stewards  
Stewardesses

### B—Government Jobs

CAA inspectors—all types

Communications  
Forest Fire patrols, etc.

### C—Army, Navy, Air Force

Air cadets

### D—Private flying

Instructors  
Flying salesmen

### E—Aircraft factories

Test Pilots  
Engineers—all types





# Skyborne Salesman

(Continued from page 29)

Came the war and there I was with a paltry 15 hours. During this time I had made friends with many licensed flyers, and while I enviously watched them march off as commissioned officers, I did the next most exciting thing and grabbed a beat-up freighter for an extended lick in the Merchant Marine. I realized then that knowing how to fly was more than a means of gratifying a burning desire. It represented a skill that was an asset to your fellow man in war or peace. I was determined then to develop that skill.

War's end found me at Charleston, West Virginia. The only field available in this mountain country was Bollinger Field. I often have likened this airport to an airplane carrier. It is almost a thousand feet above sea level and surrounded on three sides by a yawning chasm. There is barely enough surface scraped off the top of this mountain (they call it a hill—but out Michigan way anything you can't jump over is called a mountain) to provide a runway. Should you land short of the runway, you're practically shaking hands with Gabriel. Should you run off the runway either port or starboard, you'll be airborne again, though perhaps not in an attitude in accordance with the basic laws of aerodynamics. About the only thing that runway doesn't do that an aircraft carrier does is rock. Though I'm not so sure about that either. But the place had its compensating factors. The chief pilot there, Mr. Paul Graham, is just about the best instructor that ever pounded good sense into a student's thick skull. Under his expert guidance I finally emerged from the cocoon stage and sprouted wings and a license.

The plane was then ferried to Detroit and hangared at McKinley Airport in Fraser, Michigan. I started doing what comes naturally, hopping in and out of my field like a June bug. On each "hop" I'd contrive to get a little farther away. I was developing "bird sense." Every airport within a radius of 25 miles I considered my private domain. Now at this point a word to the wary is sufficient. Many a flyer will bury his brain in all types of high-sounding technical books on aviation. And whilst it will do a body no harm, I happen to know that the average traveling man neither has the time nor the inclination to do this. So I would suggest instead that you get the Martin's Almanac and read it from "kivver to kivver." Flying requires the horse sense that this book has an abundance of. You will, by practical observation and diligent application, learn everything there is to know about flying. Even as a peddler you have learned that you can find out nothing about selling from books. It is experience that really counts.

Before very long I fluttered my wings and left my nest for good. Soon I was flying all over my territory and not only doing it quickly and economically, but loving every minute of it. I did, however, find that a plane could be most unruly to a pipe smoker. You pipe smokers know that it takes every hand you've got to load a pipe. It also takes every hand you've got to fly an airplane. The two just aren't compatible. An attempt to fill my pipe would find me all over the sky and completely off course. But airmen are an in-



## CONSOLIDATED B-36

Looking like a flying cigar, the Air Force's B-36 is one of the world's largest land-based bombers. Powered by six Pratt & Whitney engines, having a total of 18,000 hp, B-36 has range of about 10,000 miles, carries 30 tons of bombs. Ship weighs 129 tons, is 163 feet long, has crew of 15. Initial cost of B-36 was \$30,000,000

genious lot—and now I've learned to surmount even that great obstacle—I can now refill my pipe without so much as a 2-degree compass deviation. I'm proud of myself.

Recently I was in Chicago talking to the vice-president of the company I work for, Mr. John Cox. Mr. Cox is a flyer of note and owns a Fairchild. He is also a patent lawyer and a perfectionist. I would surmise that his every move is guided by text and formula. While frowning a bit on my unorthodoxy in flying, he appears none-the-less pleased. Most flyers are a gregarious lot, and next to flying, they like most to talk about it. So after asking me about my last cross-country trip, Mr. Cox took out a pencil and on a piece of paper laid out a complicated navigational problem involving wind correction, compass deviation and magnetic variation. Then he asked me what my compass heading would be, involving all these deviations. I looked him bang in the eye and told him I couldn't figure it out for shucks. After that remark I had a pretty good idea of what he was thinking—but if he were able to read my thoughts, this is what he would have discerned: That the Lord in His infinite wisdom when he made the world, strategically placed the rivers and lakes where he did so that some day you and I could navigate by them. He breathed upon these rivers and lakes, and soon cities flowered. Cities that can be seen miles away, preceded by a watery trail for your guidance. Then man, taking a leaf from His book, strung railroad tracks and highways between large cities making it a simple matter for you to straddle them from the air and ride the concrete or iron "beam" right into town. And what matters it if you don't navigate "as the crow flies?" The Coo-coo which is also a bird manages to get there too—no one knows nor cares *how* he got there.

To you drummers who are foot-loose and family free, the airplane is really a boon. Actually, it is the greatest invention since the swindle sheet. No longer should it be

necessary for you to languish in your hotel rooms reading your Gideon bibles on pleasant week ends. Just get out to the field, get into your airplane and show the miserable town the cleanest pair of heels it ever saw. Your biggest problem will be in choosing the most interesting of the many places to go and things to do. If it's golf you prefer, you can land on many a golf course that has landing facilities. To eliminate the burden of lugging a golf bag with you, there is a new club invented that was practically designed for you. It is an all-purpose golf club. Just a flick of the handle will change the angle of the club head from a #1 iron clear on up to a #9 iron and putter. Throw two of them in the plane and take the gal friend or wife along. If you wish to go to a resort and relax, just pick yourself a resort and land in its front yard. Many resorts are now providing these facilities. If you prefer to swim you'll find airfields now built and a-building where you can actually dive right out of your plane and into the water. Or, if you prefer to travel with the pack, you'll have little trouble finding a field that has regular breakfast dawn patrols.

For business purposes the airplane is a necessity. You'll have more time at home (because of eliminating sleeper jumps) and you'll find you can skim more cream off the expense account because of economical operation. You can get into small towns and back the same day. I find a plane highly desirable in the mountains. If you've ever flown over mountainous roads, you will observe how they meander like aimless chicken tracks seeking a course of least resistance. You can save days in this kind of country. Many a customer whom I found most dull as a conversationalist suddenly becomes most voluble when informed casually that "my personal airplane is tethered at the local airport." His ears will really fly back then and he'll ask a thousand questions—and even coax a ride out of you. There are no age limits in flying enthusiasts. They're yours

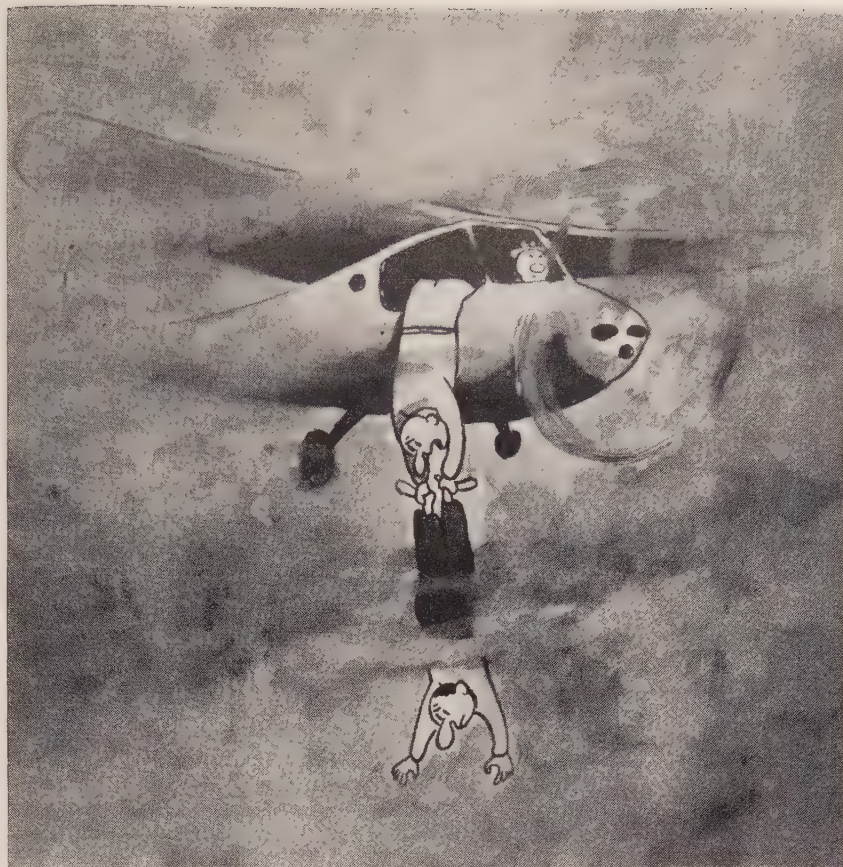


for life, and the only salesman who gets him away from you is one who flies a bigger and better airplane. And empty your mind involving large maintenance costs. There are few mechanical parts in an airplane other than your motor to cause you worryment—far fewer than in an automobile. True, there are hundred-hour checks to consider, but that's where your swindle sheet comes in. If your boss doesn't provide for this, then simply tell him that you took a customer and his wife out to dinner and between them they ate practically the side of a hog. That will do it. By operating a plane for business, you'll be more valuable to your firm because you'll cover more territory and get over it more often. Your trade will regard you in a more favorable and interesting light and you'll become a sort of a character. The boss will put a "fix" on you as a man to be watched because you stamp yourself as a man of fortitude, one who has ingenuity, one who is enterprising.

An airplane is an instrument that makes available to you other blessings. You'll make a host of friends at every airport you frequent. Try to cultivate the friendship of these small and large airport operators. They'll kill themselves trying to be of service to you. There are days that you will be unable to fly because of bad weather. On occasions like these you might have to leave your plane where it is and fall back on the old "iron hoss." Many's the time small-town operators have offered to return my plane (often hundreds of miles) at just the cost of gasoline involved and the assurance of return passage.

Not long ago I flew into Portsmouth, Ohio. They've got a kind of a tricky field there and, when I missed the approach fence by the longitudinal size of a frog's hair, I taxied toward the hangar to find a priest awaiting me. I thought surely someone phoned ahead from Huntington, West Virginia (where I made an equally sloppy landing) asking the airport to provide facilities to administer last rites when I came in. To my amazement the priest walked over to my Aeronca Chief and enthusiastically inquired into every phase of its operation. He told me he was contemplating the purchase of one of his own. Thus I find schoolteachers, farmers, lawyers and chimney sweepers—all vitally interested in flying. But who has a better right to fly these things than a traveling salesman? A fast means of locomotion is fundamentally your tools in trade. It is as much a part of it as a glib tongue, an order book and (let us not forget) the swindle sheet. So what makes better sense than buying an item that will not only pay its own way—but puts you in the yacht class? And what yachtsman wouldn't give his eye teeth to be able to use his craft to call on trade?

So take the sag out of your brow, head toward your nearest airplane dealer and try out a plane for size. Convince the boss and your friends that you don't wear lace drawers. Banish the old-fashioned auto. Forget those long back-breaking three and four hundred mile drives that had you tucked out at journey's end. Just keep sniffing the airways and project yourself into it. Change an excursion from the realm of fantasy into one of reality. And remember—a flyer never gets old—when it comes the right time he merely lays down and dies.



"Feel anything yet . . . ?"

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15811



# On the Air

(Continued from page 31)

to prevent "fading" and "blasting".

When you talk, be sure the transmitter button is depressed. But be sure it is released the instant you are through. Why? Well, here's an example of what can happen: We were coming in for a landing at a busy eastern airport the other day. The pilot called the tower for landing instructions and, as the tower was a few seconds in replying, he pushed the button to extend the landing gear. Down went the gear and off went that screeching "gear-going-down" klaxon on the instrument board. In a flash our headset roared: "If I lay my hands on the pilot whistling into the mike to get my attention he won't do that again for a loooooong time!" The pilot had forgotten to release his transmitting button and our gear klaxon was screaming all over the tower a mile away!

Now about that headset. You just clamp it on over your ears and listen—but let's get it clamped on right. It's not like a hat on a well-designed blond, (—it does the trick no matter how she parks it). A set of earphones must be worn right or the reception will be less than maximum. The earphones should be placed so that the center opening or perforations are directly over the center of your ear opening. The earphone rubber cup should fit snugly to the skin all around. If the seal is not tight, particularly under the ear lobes, bend the frame until the cups do fit snugly. If this cup seal is good a maximum of efficiency in reception is to be had.

Now we know how to talk and how to listen, but what are we going to say and hear? To begin with certain formula of speech and expression are observed, not because they sound dramatic or "hot-rock" but because they have proved to be more efficient, time saving, and more easily understood. For example, the alphabet is never used as we learned it way-back-when. There are no "A-B-C's in radio, but there are "ABLE BAKER CHARLIE's" and plenty more. All names or words difficult to understand must be spelled out, using the phonetic alphabet included with this article. The same goes for numerals except when even hundreds or thousands are used. (Note radio telephone numeral pronunciation chart)

The pronunciation of these numerals is the same as that used by telephone operators and others who use "electrical conversation" and has been proved to be the best understood through any sort of static or interference. In using the numerals in connection with a statement of time, you must

use the 24-hour clock. Hours will be stated in the first two figures and the minutes in the second or last two numerals. Four figures will always be used. For example, midnight will be "ZERO ZERO ZERO ZERO" and noon will be "WUN TOO ZERO ZERO". Such a time as 4:43 PM, will be transmitted as "WUN SIX FO-WER THUH-REE" and those before noon will be called "ZERO NINE TOO THUH-REE" (9:23 AM.)

Now let's see how you put these things together to use. In calling a station or tower from your aircraft, you first call the name of the station you are calling, followed by your identification (the NC and final four digits of the license number of hour aircraft) like this: "COLBERG TOWER-THIS IS NC 2345-OVER". Every transmission will end with either "OVER" or "OUT". "OVER"—meaning I'm through but expect a reply from you, and "OUT" meaning I'm through and no response is expected. If Colberg Tower gets the above "contact call," it will reply: "NC 2345 THIS IS COLBERG TOWER—WHAT IS YOUR MESSAGE (or WHAT IS YOUR POSITION)—OVER"

This is your cue to go ahead with your message or report your position thusly: "COLBERG TOWER—THIS IS NC12345—TWO MILES SOUTH at WUN THOW-ZAND—OVER". This position report tells the Tower where you are and what your altitude is so that the tower operator may plan your approach into the pattern. From here on in, landing instructions and such information as field altitude, wind direction, runway to use, field conditions and emergency information is exchanged. You will acknowledge each message, using your plane's NC license number as a signature.

Once a good radio contact has been established you may cut your signature down to the NC and the last three numerals to save time and to help keep the Tower channel clear. Rather than the full NC12345 you may use NC345, and it is usually permissible to just use COLBERG without the word TOWER added. Once you are within sight of the Tower, it is sometimes requested that you identify your plane by make as well as license number in order that the Tower operator may spot you from his post and positively identify you in the pattern. In this case your message would run: "COLBERG THIS IS PIPER NC345—LANDING INSTRUCTIONS—OVER" and the Tower will use the same identification in reply: "PIPER NC345 THIS IS COLBERG—(message)—OVER".

If words are missed or you are not sure of them, ask for a repeat. The procedure phrases for this are "SAY AGAIN" and "I SAY AGAIN." They are used in con-

junction with "ALL BEFORE", "ALL AFTER" or "WORD AFTER," giving the word after which you lost the message or meaning. For example:—if you muffed everything alter the word "then," your message would sound: "SAY AGAIN ALL AFTER THEN" and the repeat would come back "I SAY AGAIN ALL AFTER THEN—" followed by the missed words.

Of course if the transmitter makes a mistake and catches it at once he must retransmit the correct information or word. Let's say you are reporting your position thus: "NC12345 OVER RIDGE FAN MARKER—ZERO TOO WUN SEVEN—AT FOUR THOW-SAND — CORRECTION THREE THOW-ZAND—OVER". If you catch it too late, you repeat the message giving the last phrase or group of words sent correctly and then say "CORRECTION" and give the correct information in place of the wrong item.

## Pronunciation

In order that radio time may be saved, certain words and phrases have become acceptable in place of long expressions or paragraphs of chatter. Here are the most commonly used and understood. Be sure that these are used exactly or they may be interpreted to mean something entirely different: ROGER—I have received all of your last transmission.

ACKNOWLEDGE—(Used by originator)

Let me know if you have received and understand all of this message.

WILCO—Your message received and understood and will be complied with (if an order to do something). WILCO will also be used in response to the procedure word "ACKNOWLEDGE" in voice messages, and may also be used to acknowledge and capability to comply with an order received even if a request for acknowledgement is not included. ("ROGER" is included in the meaning of "WILCO" so they are never used together.

HOW DO YOU HEAR ME?—Just that.

SPEAK SLOWER—Just that.

WAIT—If used alone, it indicates that the transmitter must stop his message for a moment but is not leaving the air for he will be but a moment. If the pause is to be longer than a few seconds, the word OUT will be added to make it "WAIT, OUT," preventing the other stations broadcasting before the message continues.

SAY AGAIN—Repeat your message.

I SAY AGAIN—I will repeat my message.

VERIFY—Check coding (if any), check text again and send correct version. Used sometimes in a relayed message from another station when it doesn't appear to be accurate or is unusual in wording.

MESSAGE FOR YOU—I wish to send you a message.

SEND YOUR MESSAGE—I am ready to receive, go ahead.

READ BACK—Read back this entire message after I have transmitted "OVER".

THAT IS CORRECT—You are correct.

WORDS TWICE—This may be used by both the transmitter and receiver. Used by the transmitter to indicate that every phrase will be sent twice, and by the receiver to request the repeating of every phrase twice. This is used when transmission is difficult.

CORRECTION—An error has been made in this transmission. The correct version is—

(Continued on page 62)





# Hangar Flying

(Continued from page 16)

CAA-DESIGNATED flight examiners are now being allowed to issue permanent-type student pilot certificates. Formerly, flight examiners could issue only the temporary certificates; permanent ones coming direct from Washington. This will do much to speed up issuance of student pilot tickets.

**UNITED Pilots & Mechanics Association** reports a man in Texas (Mr. Vernon L. Mallory, of Mineral Wells, Texas, to be specific) has invented a radio device which turns on lights at unattended airfields. The gadget that's carried in your airplane weighs about 20 ounces, is tied in with ordinary radio transmitter. When a button is pushed, it transmits a tone to receiver on ground which converts it to an impulse that switches on the lights. Installation in your plane would cost \$10; field installation is estimated at about \$1,000.

**NAT'L GUARD DAY** was Sept. 16. On that day began a nationwide recruiting contest aimed at raising 88,888 recruits for the coun-

try's historic volunteer reserve force. Called National Guard Assembly, the recruiting contest will run through Nov. 17, and will be open to enlisted men in Nat'l Guard.

## AVIATION CALENDAR:

- Oct. 2-4: SAE Autumn Meeting, Biltmore Hotel, Los Angeles.
- Oct. 3-5: Arizona Third Annual State Aviation Conf., Douglas.
- Oct. 4-5: Arizona Airmen's Convention, Douglas, Ariz.
- Oct. 10-13: S. Calif. Nat'l Air Races, Long Beach, Calif.
- Oct. 24: Pacific Coast Intercollegiate Air Meet, Livermore Naval Air Station, California.
- Oct. 26-28: Nat'l Assoc. State Aviation, Ft. Worth, Texas.
- Nov. 4-7: National Airport Show & Institute, Municipal Auditorium, Cleveland, Ohio.
- Nov. 19-22: National Aviation Clinic, State Capitol Bldg., Springfield, Illinois

**PRINCETON UNIVERSITY** recently started construction on a 4,000-mph wind tunnel designed to solve wide range of problems connected with supersonic flight. This tunnel will be able to simulate conditions of flight from altitudes of sea level to 200,000 feet and speeds from 1,100 to 4,000 mph.

**INSTRUCTION DEPT:** Instructor was giving some dual time in two-turn spins. The air was very turbulent. After first two-turn spin, instructor noticed he came out of spin at exact altitude he had gone into it. He tried again . . . same thing happened. Into spin at 5,000 feet; out of spin at 5,000 feet. Cutting throttle back, he put plane into normal glide. The altimeter needle immediately started to spin clockwise. Result: Instructor hit for home in a hurry via steep spirals, series of spins. (C. Kittle Jr.)

**STUDENT PILOT** at Easterwood Field (Texas) could not seem to get the "feel" of the rudder during landing. After shooting landings for sometime, with no improvement shown on part of student, instructor had him take off his shoes, fly in stocking feet, and do a little fast taxiing on ground. Student has had good "feel" since. (J. M. Holman)



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Dr. T. B. Lyons, President and Treasurer, has had wide experience in school administration and aviation. He was for many years connected with the Pittsburgh Board of Education, and was General Manager of the Graham Aviation Co. which operated a Primary Training School for the U. S. Army Air Forces at Souther Field, Ga. Dr. Lyons is a graduate of Lock Haven State Teachers College and the University of Pittsburgh and is listed in WHO'S WHO in American Education. He assumed his duties at P. I. A. Dec. 1, 1944.

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## Crippled Pigeon

(Continued from page 34)

gions, the chilled metal invariably causes moisture to condense upon it. It is not the water itself, but the chemicals contained in it that cause the trouble. The amount and type of chemicals present will vary widely with different localities. In coastal areas, atmospheric moisture contains a very high concentration of harmful chlorides; the air near large cities and industrial centers is also strongly polluted. The air over inland arid districts is least harmful.

When corrosion is found to exist on any part of the airplane, two specific steps are necessary—first, the corrosion must be cleaned away down to bare metal and, secondly, the area must be refinished to prevent further deterioration. It is absolutely useless to paint over an area without first removing all corroded metal, as the chemicals already at work will continue their destructive job.

When the corroded part is made of steel, the job is quite simple—merely clean away all rust or other corrosion and refinish. It's a bit more complicated when aluminum is involved. In this case, use a wire brush, scraper or sand paper to clean away all corroded metal. Be careful not to go too deep or remove more metal than is necessary. The next step is to thoroughly swab the area with a 5 to 10 per cent solution of chromic acid in water. This solution will neutralize any chemicals still present, and will clean the area so subsequently applied paint will adhere. Follow with a cold water rinse, and when dry apply two coats of zinc chromate primer. If the part previously has been painted, apply a third coat of colored enamel to blend with the other portions.

There are danger points on every airplane that should be carefully watched for the appearance of corrosion. These points exist wherever two or more dissimilar metals are in contact, and especially when one of the metals is aluminum. When dissimilar metals are brought into contact, what is known to metallurgists as "electrolytic corrosion" starts immediately. This is why during initial assembly of the airplane all dissimilar metal contacts are carefully insulated by several coats of zinc chromate primer or other insulating material.

During the service life of an airplane, a joint may become slightly loose, and chafing—caused by vibration or other stresses—will wear the protective coatings away. When this happens, corrosion starts immediately. When corrosion is noted in a dissimilar metal joint, loosen the joint sufficiently to allow cleaning away of all corroded metal. Swab the joint with a 5 to 10 per cent chromic acid solution and rinse with cold water. Then, before reassembly or tightening, paint all contacting surfaces with three or four coats of zinc chromate primer. This material dries very quickly and the entire application will require not more than a few minutes. After assembly, make certain that any nuts loosened or removed are saftied.

Danger from a part that has suffered mechanical injury depends to a large extent upon the location and nature of the injury and the amount of stress imposed upon the part during operation. A dented airframe tube would be worth worrying about a little, while a slightly bent gear strut would re-

quire much concern and immediate replacement. From the standpoint of preventive maintenance accomplished by the pilot himself, the most dangerous mechanical injury to be corrected is a sharp-bottomed V-shaped scratch or niche in a part subjected to heavy loads during service, or to extreme vibratory loads during flight.

When a V-shaped scratch or dent occurs in any metal part that must carry a load, stress concentrations exceeding the tensile strength of the metal are very liable to occur near the bottom of the "V." Under extreme load conditions, or when the injury is sufficiently deep, these induced stresses may cause immediate failure. In event of severe injury always call it to the attention of a competent mechanic.

Deep scratches in clad aluminum should receive attention as soon as discovered. In many cases the scratch will have penetrated the clad coating of pure, corrosion-resistant aluminum and the underlying corrosive high-strength alloy will be exposed. Under such condition, corrosion will start almost immediately, the metallurgical condition of the high-strength alloy will change, and failure is liable to occur.

The method of handling V-shaped dents and scratches is simple. Using a good grade of cutting paper, grind out the scratch leaving a rounded shallow depression. The important point is to make certain that all of the scratch has been removed, yet do not remove more metal than is necessary. After the scratch has been ground out, polish the area with a very fine grade of polishing paper, then refinish as for corroded areas.

The importance of watching for and removing small V-shaped scratches in highly stressed parts cannot be over-emphasized. A square bar of hard tool steel will withstand a tremendous blow without breaking, yet when a sharp-bottomed notch is ground in one side, the bar may be broken with a light blow from a hand hammer.

In the case of the Crippled Pigeon, those canvas patches crudely sewed in place by Shad Williams and the typewriter of the author never came off, and the oil used in the OX-5 motor was the type that would not rot fabric. Would be that such patches and oil were available to every real-life pilot. But such is not the case, and therefore one of the greatest headaches confronting every pilot with a fabric-covered airplane is maintenance of said fabric in a flyable and decent looking condition.

In speaking of aircraft fabric, it is usually considered to be in the doped condition. Without dope, airplane fabric would be a useless material. It would stretch easily and rot quickly when exposed to air. It is the application of dope after the fabric has been installed that gives it its tautness, its weather-resistance, and the smooth finish that adds to a plane's aerodynamic efficiency.

In preventive maintenance, every effort should be made to keep the doped surfaces in a smooth, unbroken condition. When this is accomplished, the underlying fabric will take care of itself. There are several easily detected signs that will indicate a doped surface is beginning to deteriorate and needs attention. Small cracks or checks may appear; there may be a slight peeling or scabbing of the dope on various areas; "ringworms," or small circular checked areas may make their appearance.

The greatest factor in preserving doped

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abric is cleanliness. All dirt adhering to the fabric, much like atmospheric moisture, contains harmful chemicals. These chemicals react with the chemicals in the dope and deterioration sets in. When the doped surfaces appear dirty, grimy, or begin to look dull, get out the soap and water and begin.

Slightly warm water is best when available. Always use a castile-type soap, never an alkali-type soap as the alkali is harmful to the dope. Rinse away all soap after the surface has been cleaned. Occasionally a leaky oil tank or line will spatter the fabric with oil. In this case, with careful observation of all fire hazards, swab the oily area thoroughly with unleaded gasoline. Swab gently. Never rub briskly as static electricity sparks may occur with very upsetting and harmful results. Tar kicked up from the runway and adhering to the fabric may be removed in the same manner. After the oil has been swabbed away, wash the area with soap and water in the usual manner.

When the dope on a wing, aileron or fuselage has actually begun to crack or peel, the only remedy is to sand away the defective dope and apply new coatings. Choose a clear, dry day for this work. Use a very fine grade of cutting paper and sand until all visible cracks or checks disappear. Apply two or three coats of clear dope, allowing each to dry thoroughly. Follow this with a coating of dope, pigmented to blend in color.

Occasionally the dope will seem to be in good condition, but the fabric will give evidence of having lost its tautness. When thumped with the finger, the characteristic bass-drum sound is gone. In many cases it will be possible to restore the original tautness by applying a coat of pigmented dope over that area on the airplane. First, clean the area with soap and water, then spray with a light application of dope thinner. This will soften the old dope so that the new coating can take effect. Follow this immediately with a liberal application of dope, pigmented to blend with the color scheme.

The application of patches is more complicated, and reference should be made to a reliable repair manual when attempting this type of work. There are various types of stitches to be used in attaching the patch, dependent upon its location and availability for sewing. Nevertheless, from the preventive maintenance angle, a hole in the fabric, even a very small one, should receive immediate attention. The dope around the edge of the hole will have been destroyed, and deterioration of the unprotected fabric will set in immediately, working progressively outward from the injured area.

A busy afternoon may be spent removing stressed connections and checking bolt holes for elongation. An elongated bolt hole is a direct invitation to a sheared bolt. Welds have a habit of cracking, and the many welded connections in tubular fuselage, landing gear and engine mount should be occasionally examined. The best washing job will fail to remove all dirt and grease from deep recesses. Clean these recesses individually by hand and inspect the metal underneath for signs of corrosion. Engine baffles get filled with dirt which seriously hampers cooling. Use an air hose and a fine wire brush to remove such accumulations. Go over all control cables, an inch at a time, and look for broken cable strands. Though a single broken strand may not seriously endanger cable strength, the strand may feather

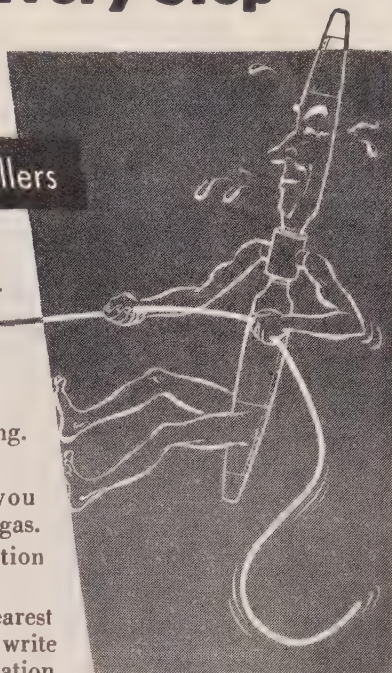
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out and catch on something, thereby jamming the controls.

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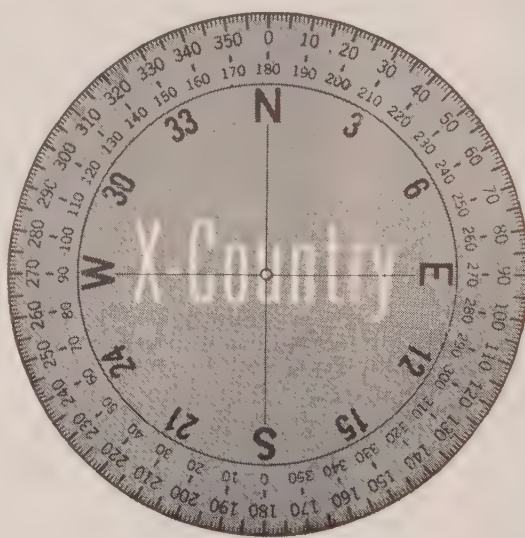
pile. You're not that lucky. You'll have to get out of tight spots yourself. But the simple way is to avoid many tight spots by correcting small defects before they reach dangerous proportions. That way you'll get back, and with a little more luck, may be able to pick up a date all by yourself!







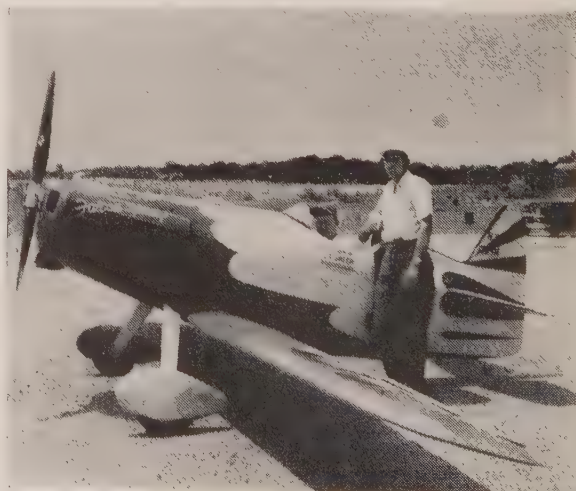
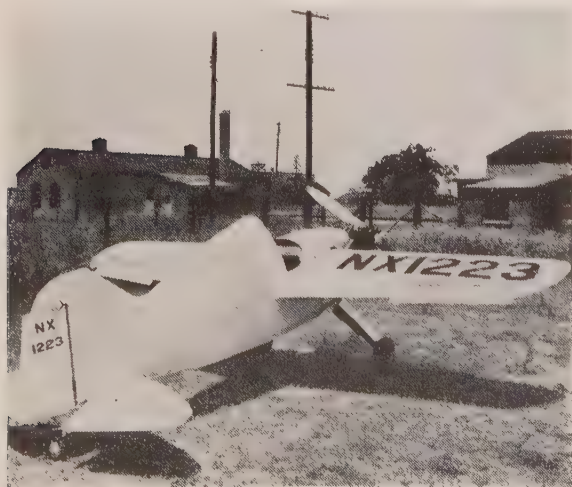
**AIR SHOW** stunt originated by George Lambros pleased a crowd, but don't you try it! It worked this way—Lambros flew over field. Instructor Kulick climbed out on right-hand float, and waved cheerily to land-lubbers below. Then Lambros cut switch and, while plane was in glide, Kulick strolled forward, gave the prop a twist and re-started the engine. One time, however, engine wouldn't start and Lambros had to land ship on an asphalt runway. Lambros took plane off via two-wheel dolly.



**MOUNTAIN FLYING** is tricky no matter what plane you're flying. But to help matters for Utah pilots, Designer Harry J. Thalman built a plane especially for mountain flying. His plane, called a *Thalman Special*, has cruising speed of 130 mph, will land at low speed of 25 mph with full flaps. Service ceiling is 18,000 feet, and rate of climb is said to be 1,000 feet per minute. Note unusual tail assembly of two-seater. This tail is said to improve the *Thalman Special's* stall and spin characteristics.

**AIR RACER** capable of speeds in vicinity of 200 mph was entered in Goodyear Race in 1947 Nat'l's. Owned by two women aviation enthusiasts from Cleveland, it was named for late Marge Hurlburt. Ship has wingspread of 16 feet, 5 inches, is 17 feet long, is powered by 85-hp Continental engine.

**FALCON SPECIAL** was another tiny racer entered in Goodyear Trophy Race, Cleveland. This one has wingspread of 22 feet, is 13 feet 6 inches long. Powered by 85-hp Continental engine, the *Falcon Special* has speed of over 175 mph. Ship is owned by R. S. Hopkins (right) and C. P. Smith.





# 400,000 Personal Aircraft

(Continued from page 37)

interest to the CAA, would permit safe crosswind landings under any condition. The CAA's crosswind landing gear development program has produced six models, diversified as to size of aircraft, shock-absorber design, and chassis arrangement (conventional and tricycle). Three types of crosswind landing gears are now flying. One, developed by Fairchild; another by Goodyear for the Piper Cub, and a third by Firestone, mounted on an *Ercoupe*. Installations are now in the process of development for the Bellanca, the Beech and the sixth is being worked out by Goodyear, for DC-3.

Because of the extremely favorable results achieved thus far, I do not hesitate to predict the universal adoption of the caster crosswind landing gear for personal aircraft. The slight increases in weight and cost will be insignificant when compared with the added advantages such a gear offers.

Safety being a requirement in the personal plane with appeal, I would like to make a plea for an increased rate of climb as an accident inhibitor. Statistics indicate a decided decrease in stall-spin accidents with increase in rate of climb. This is particularly important where aircraft are to be operated from fields high above sea level and in hot climates. The rate of climb in the personal plane should be not less than 500 feet per minute under standard air, sea-level conditions.

Another entirely practicable and readily available aid to safety in plane operation is the stall-warning device. This should be a part of the personal plane's equipment.

Next is the need for care in obtaining positive static and dynamic stability, qualities in the aircraft that make for ease of flying and that call for less constant attention to the controls. The two-control system is an aid in this direction.

Over-loading of aircraft and an improper distribution of load, creating large shifts in CG, should be done away with. Design should be based on the premise that, with full gas and oil tanks and 170 pounds in every seat and all luggage in place, gross weight will not be exceeded or improper balance obtained. A weight and balance indicator, available to the pilot, would be important in preventing error here.

Design for ease of maintenance will contribute toward proper maintenance. Improved visibility will help to eliminate collision and accidents. Better ground stability and the use of crosswind landing gear also will assist in this regard.

If a plane incorporating all these features were to be designed and should it be placarded against acrobatic maneuvers, a weight compensating reduction in load factors would, I believe, be permissible with a substantial improvement in over-all safety. A desirable added feature for such a plane would be the attainment of a large increase in stick force per "g," reaching possibly 45 pounds at a load factor of three.

One final device for improving personal-plane safety is a "flight operating characteristic indicator." This would make readily available to the pilot such essential airplane characteristics as take-off distance, best climb speed, maximum rate of climb, landing distance, and indicated stalling speed (0° and full flap) . . . all under combinations of the variables—gross weight, airport altitude, temperature and wind velocity. Were those variables to have 2,5,5 and 3 variations each, 150 tables of data would result. However, a display box has been devised experimentally which permits very rapid selection of the proper table (tables printed on a roll of paper for turning so pilot can read through display window).

Another ill to be cured in the personal plane is the problem of noise. Many an airport has been the victim of irate residents complaining of the noise from personal planes. However, a program of research investigation by the NACA is bringing us closer to the solution of this problem. Using a Stinson with 190-hp engine, one successful experiment involved a geared engine with muffler and a five-bladed propeller. There was a very noticeable reduction in noise.

There is no doubt but that future personal aircraft will have to be equipped with exhaust mufflers, a geared-down engine and at least a four-bladed prop to assure noise reduction.

Roadability is another desirable factor. Being able to use the same basic vehicle when traveling in the air or on the ground would certainly answer the plane-owners problem of transportation between airport and home, etc. Various suggestions have been made in this direction, the natural first thought being to fold the wings of the airplane. Although this would be important from the standpoint of reducing necessary hangar space, it would not result in what could be considered a satisfactory road vehicle.

Another method would be to remove the (Continued on page 54)

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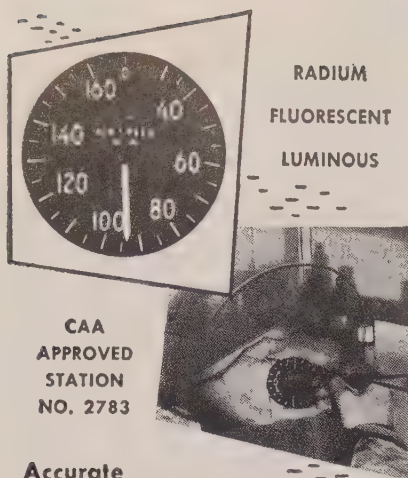
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# 400,000 Aircraft

(Continued from page 53)

wings entirely, storing them in the hangar, and to use the remainder of the airplane as a road vehicle.

A third possibility calls for the removal of everything involved in flight. This would mean wing mounting of booms for supporting the tail unit; of the powerplant unit; and of flying controls, so that with the removal of the whole assembly a suitable vehicle for road travel would remain. This idea, of course, would require a small separate powerplant for driving the resultant automobile. Certainly such a vehicle would be satisfactory for town driving and for limited cross-country transportation. Possibly, too, there would be some market for the ground vehicle alone, perhaps as a first step toward ownership of the combined air-road machine.

This airplane-automobile combination, of course, is not a solution to all-weather travel. Aids to air navigation and landing are called for here.

The problems of incorporating in a plane the airborne equipment necessary for the pilot to use (in bad weather) the electronic ground aids now being provided is a serious one. Weight and expense of this equipment is, in many cases, prohibitive. However, some of the ground aids now being set up are suitable for the personal pilot's use with very little added weight and cost occurring from the installation of such equipment. For example, there is the VHF omni-directional range which will permit navigation without need for use of the airways. Although these range stations are currently being installed to serve airways between principal points, eventually their installation in the United States will give nationwide coverage so that with the omni-directional feature, the private owner flying a plane equipped with suitable receiving equipment can find his way from any place to any other location in the country.

The problem of landing under instrument conditions is, however, more difficult to solve than straight navigation. The GCA (Ground Controlled Approach) system is suitable for the private flyer as he needs no other airborne equipment than his normal radio receiver. However, the cost, including installation, operation and maintenance, for a nationwide coverage of such stations reaching into small places where the private flyer lives, would be tremendous and prohibitive.

It will also undoubtedly be a considerable time before private owners will be able to afford the airborne equipment necessary for the use of the complete ILS (Instrument Landing System) including the glide path. Their VHF range receiver will be, however, suitable for use on the localizer so that with accurate altimeter, possibly ADF (Automatic Direction Finder), and field and approach lighting, this combination would permit very substantial steps towards reduced-visibility landing. It does appear practicable by means of electronic aids to make it possible for the private owner to fly more than 90 per cent of the time, on the average, which should greatly enhance the usefulness of the personal aircraft and substantially remove weather delays as a deterrent to the prospective purchaser of an aircraft for private use.

Now that we've covered the subject of what might be called an "ideal" personal plane, let's put all the "requirements" together and

see what we've got:

Size and General Arrangement

Four place with adequate space for luggage.

Gross weight of 2,500 to 3,000 lbs. (empty weight of 1550 to 1800 lbs., airframe weight of 1000 to 1200 lbs.)

Low-wing and possibly a pusher

Unrestricted pilot view at all times

About 200 horsepower

Tricycle landing gear

Performance:

150-mph Cruising

40-mph landing speed (45-mph stalling)

500 fpm minimum, sea level rate of climb

Safety Features:

Non-vicious spinning characteristics (non-spinnable or rapid recovery)

Two control (optional)

Stall warning device

Flight operating characteristics indicator

Simplification of engine and prop controls

Special Equipment:

Low external noise level (also internal for passengers)

Radio receiver and transmitter

Range-receiving equipment

Consideration of use of gas turbine-prop combination

Castering wheels for crosswind landings

A personal plane incorporating these features has the utility that will attract a large market, thereby permitting a reduction in price. It provides a utility, in short, that will put into motion a benevolent spiral that will lead to a goal of importance for private flying.

One final matter to be concerned with is the subject of cost. At the present time airplane costs are beyond that which would attract a large market. To answer this problem there will have to be a considerable reduction in prices of four-place planes. I believe that at a figure that would lie between \$4400 and \$5400, the market forecast for 1955 can be reached. Today, an airplane meeting the specifications of the "ideal" family personal plane would cost somewhere in the vicinity of \$7900.

By careful designing, production costs can be reduced about 12 per cent, which is made up of a 20 per cent reduction on the basis of improved design-for-production of the present aircraft structure, partially counter-balanced by an 8 per cent increase in cost incident to added complications and added devices which the public will demand in order to obtain proper utility.

Next there is the all-important reduction in cost incident to increase in production quantity. This matter was dealt with in considerable detail in a paper I presented before the Royal Aeronautical Society in November, 1938. Curves were there developed to show that labor costs can be reduced 20 per cent each time the production quantity is doubled. This is the so-called 80 per cent curve rule. Similarly, it was shown that corresponding cost-production curves for other factors of cost apply as follows: raw material, 95 per cent; purchased parts, 90 per cent; and finally total cost and sales price (allowing for the appropriate proportion that each of the above three factors bears to the total varying quantity) at 85 to 90 per cent, with a value in the production quantity region which is of immediate interest to us, of 87 per cent. I might mention in passing that our wartime experience in production fully substantiated the production curve analysis on which these conclusions that I have mentioned are based.

It is anticipated that output of personal air



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craft produced by the average firm will increase slightly more than five-fold between the present and 1955, which when applying the above formula for cost variation, would mean a plane price reduction of about 30 per cent. Combining this factor with the 12 per cent reduction incident to improved design mentioned above, leads to the conclusion that the final price of personal aircraft of eight years hence can be about 62 per cent of the present cost—and with a great deal of value utility added.

On the basis of price reductions coupled with added utility necessary to start and continue the benevolent spiral in operation, it appears that the forecast of an average registration increase of 30 per cent each year, on which the 400,000 by 1955 figure is based, will come about.

The rapidity with which the aircraft industry met the pent-up demands of 1946 is an indication that a supply of planes will be available as the demand for them increases. The 1947 slump in sales was to be expected because of the abnormal nature of the demand of 1946. One alleviating factor is that the stock of military surplus aircraft is now depleted so that this source will not absorb the substantial market it did the first year after the war. Again, therefore, I do not hesitate to forecast that the 30 per cent increase in registrations each year will come about. (See chart on page 36, bottom right.) Naturally, there will be periodic deviations from a straight line variation. The increase, however, will require the improvements in design, as I have already brought out, over the prewar models which are still being sold today.


I have alluded to the matter of operating costs, which contains many factors, the discussion of which in themselves would require complete paper. Commensurate reductions in operating costs also will result. This will be due to the following reasons:

1. Depreciation, a most important item amounting 26 per cent of the total, will automatically drop by virtue of reduction in initial sales price and improved design making for increased life.
2. Insurance costs, which are of about the same magnitude, will be reduced incident to reduced cost of the item insured, to improved safety records and other factors.
3. Hangar rent, which surprisingly forms about 13 per cent of the total, will be lowered by design innovations such as folding or removable wings.
4. Maintenance and repair costs, which are about 15 per cent, will be reduced by design improvements and, of course, by some reduction in cost of spare parts.
5. Finally, there is the cost of fuel and oil which alone may remain about constant.

In order to appreciate the importance in reduction of operating costs it can be stated that at present the cost of one year's operation is approximately one-half of initial sales price. I believe that this figure can be reduced approximately one-quarter.

I repeat again, with the continuance of the air-point program I submitted in 1945 . . . with emphasis now on the development of utility in the personal plane and the subsequent reduction in costs, there will be, by 1955, 400,000 personal aircraft in the United States—that is the goal of importance for private flying.

The remarks of Mr. T. P. Wright were taken from a paper he presented in London.



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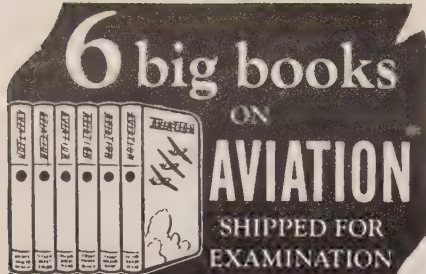
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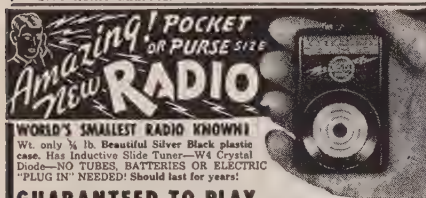
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# Grow Up With Instruments

(Continued from page 39)

is pushing and pulling on the stick. The needle never seems to stay right on the point. That's because the airspeed indicator is a skittish colt and must be led ever so slightly. When the needle nears the desired reading exert opposite pressure to slow it down, then relax pressure to hold it there.

To find out just how much pressure you need, try this.

(1) Pull stick back to decrease your A/S below 70. Now bring it back to 70.

(2) Push your stick forward to increase your A/S. Now bring it back to 70.

Try this again and again until you can stop the indicator at any desired reading. You will find that you develop an unconscious response to the movement of the needle as though a thin cord stretched between the stick and the airspeed indicator.

There is a definite relation between the airspeed indicator and the altimeter. For example: Back stick will decrease airspeed but will increase altitude. Back throttle will decrease airspeed and also altitude.

Therefore there must be coordination in the control of the two instruments. If constant airspeed is desired while increasing altitude, hold back on stick while pushing throttle forward.

This will be clear if you try the following experiments, keeping the proper control of each instrument in your mind.

(1) At 2,000 feet increase altitude to 2,500 keeping airspeed at 70. (Forward throttle to increase altitude. Back stick to keep airspeed from increasing.)

(2) At 2,500 feet increase airspeed to 75 keeping altitude at 2,500. (Forward stick to increase airspeed. Forward throttle to keep altitude from decreasing.)

Any number of variations of this may be tried. The more the better.

When you feel that you have made progress with the control of the airspeed indicator and the altimeter, switch your attention to the tachometer.

Cut your throttle, and what you expected does happen—the engine rpm's fall off. Open your throttle—and the rpm's increase. That's the story; your tachometer measures the power output of your engine; and, with the throttle, keep the indicator on the tachometer below that red danger line.

Try out your attention to those instruments when you go in for your landing. Make a neat, correct traffic pattern. Let down at a constant airspeed. If the pattern calls for 800 feet, make it 800 feet and not a sloppy 950! Keep that head moving from left to right—look for other planes, and read our instruments!

The compass is next on the list. Take your plane up again. Pick a clear area away from traffic and line up with a road or section line that you have found lies North and South. If possible, try to pick a point where East and West are also clearly defined.

Line up heading North. Now make a 180° coordinated turn to the right. As you start your turn, the compass, instead of turning with you, takes a backward sprint and lags behind your actual direction. This lag continues until you get away from North.

As you continue turning toward South, the compass runs ahead of your actual direction. This runahead keeps up until you stop your turn on South and fly straight and level. You'll find you have to fly straight and level for a few seconds before trying to read the compass—this because it oscillates or swings back and forth.

Make another 180° turn to the right and see what happens. Around South, when you start the turn, there is a runahead. Then as you near North, the compass slows down again. That's lag creeping in.

No doubt you have noticed that around East and West your compass reading corresponds to your actual direction. It is also true that around East and West it takes less time for the compass to settle down or stop oscillating.

Making sure that your turns are coordinated, try these turns again and again until you get a good idea of the amount of lag and runahead.

Deviation is another important element in compass reading. Deviation is caused by the structural magnetism of the plane, causing the compass to read a few degrees off. For example, if we wanted to fly North we might have to fly 356° or 4° off North. In every plane there should be a deviation card telling you the heading to fly to get a correct course.

As you fly around the area, keep checking your compass until you can read it at a glance. Have always before you a clear picture of the direction in which you are heading.

Now comes the ball-bank indicator, controlled primarily by the ailerons but affected by the rudders.

If you are flying straight and your ball is centered, it means your wings are level. In a coordinated turn, your ball also will be centered, indicating the proper degree of bank for the rate of turn.

Try these:

(1) Keeping the nose straight with the rudder, bank your plane from side to side. When the right wing is down, the ball is off to the right. Left wing down, the ball is off to the left.

(2) Keeping your wings level with the ailerons, notice how the use of the rudder affects the ball. Give it right rudder, the ball swings off to the left. Give it left rudder, the ball swings off to the right.

Experimenting with a number of such positions, you will soon see the necessity of coordination between ailerons and rudder. Remember, however, that the main control for the ball-bank indicator is the ailerons.

Before we leave our small plane, there is one more instrument we should learn to keep a constant watch on. This is the oil-pressure gauge. As soon as your engine turns over, look to see that you do have pressure. If you don't, cut the engine and find out why. If you ever see that reading drop in flight, come in first and then find out why.

Right about now, after your session with each instrument, is the time to combine all this knowledge and make all the instruments work together. There's no better way of doing this than on a cross-country flight.

Secure the proper map and plan your course. At 70 mph you find that it will take you two hours and 20 minutes to make a trip of 150 miles. Your heading will be 356° and you will fly at altitude of 2,000 feet.



You will be surprised to find how much fun you can get out of making your trip as accurate as possible. Keep that heading flat. Don't let your airspeed fluctuate from 65 to 75, keep it on a steady 70. In addition, you will get into the habit of using your watch, for you are going to check the time against the check points every 10 minutes.

When you arrive at your destination and have hit your ETA on the nose—Brother—you feel good! What's more, you've discovered that your instruments can be a great deal of help to you in improving the accuracy of your contact flying.

That's when you're ready for that *Navion*, *Bonanza*, *Seabee* or any other bigger ship.

Take a look at the instrument panel on the larger ships of your choice. There they are—altimeter, airspeed indicator, tachometer, ball-bank indicator, compass and oil-pressure gauge. You may not be able to make a perfect take-off and landing, but of one thing you are sure—when you get into the air that airspeed indicator is controlled by the elevators. *Cubs* and *Bonanzas* don't differ in that respect.

Perhaps, as you take a longer look at this new panel, you spot a few instruments that are strangers. For the most part they tell you the same thing the other instruments do only more accurately. They make life easier.

The *directional gyro* is the big sister of the compass. Remember how hard it was to keep on your heading because of compass oscillation? All you do now is set the gyro on the desired heading and it turns as smoothly as a greased wheel, without a sign of oscillation, lag or runahead. Just check against your compass every 15 minutes; for the gyro, if left alone, will stray a bit.

Your *artificial horizon* is the mother of them all in that it shows you the attitude of your ship. There is no lag or oscillation in this one. The "model" plane on the face of the instrument, climbs and glides and banks around the indicated horizon line just as does the actual plane. This is a big help in maintaining straight-and-level flight.

There is one new instrument on our panel which we touched on in connection with the ball-bank indicator. This is the *Turn Indicator*. The turn indicator is controlled primarily by the ailerons. Right rudder moves the needle to the right. Left rudder moves the needle to the left. When the needle is centered we are in straight flight. Remembering the problems used in connection with the ball-bank indicator, you will realize that these two instruments are so closely co-ordinated that it is almost impossible to separate them. In fact, they are now combined under the name of *Turn-and-Bank Indicator*.

Have your check pilot take you up and show you the proper working of all of these new instruments, especially the important *Turn-and-Bank Indicator*.

When practice has made you confident in your new ship, top everything off with a cross-country, making a longer trip this time, for you have more range.

It is that now you'll realize the hours spent in the small plane familiarizing yourself with the instruments is time well spent. You know how to control each instrument and in turn the attitude of the ship, whether you are flying a *Cub*, *Navion*, or a *DC-4*.

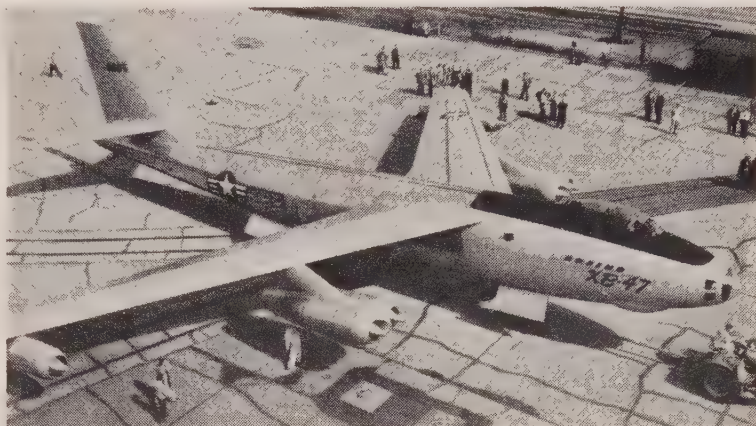
You've got instrument know-how. So how about meeting me at five o'clock, on a 270 heading at 5,000 feet, over Trout Lake? ✈✈

## ERCOUPE WINNERS!

JUST at press time, the judges of the SKYWAYS' Ercoupe Contest came through with their verdicts. We'll run their pictures in December issue.

- Contest 1** "Why I Want to Own an Ercoupe"  
**Winner:** Mrs. John F. Miller, Jr., Louisville, Ky.
- Contest 2** "What I Consider Ideal Features . . ."  
**Winner:** Mr. Charles Curry, Minneapolis, Minn.
- Contest 3** "What I Consider Requisites of . . . Pilot"  
**Winner:** Mr. Walter G. Schmitt, Miami Beach, Fla.

**CONGRATULATIONS . . . and Happy Ercoupe landings!**

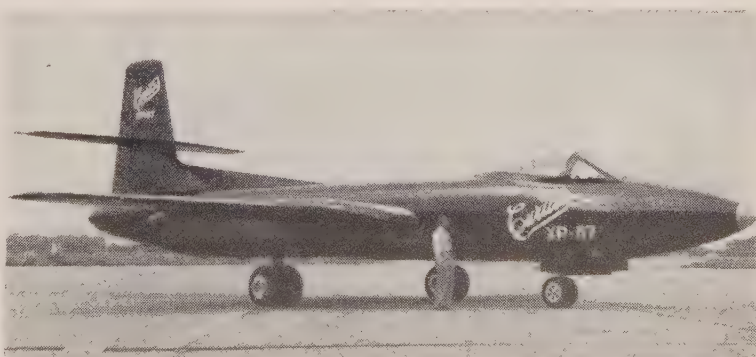


BOEING XB-47 with its six jet units, swept-back wings is about size of B-29

### Two New Jet Planes

THE Air Force recently announced two new jet planes, one a fighter plane, and the other a bomber. The very radical experimental jet bomber, Boeing XB-47, is about the size of the B-29, has swept-back wings under which are mounted the six jet engines. It also has nine jet-assist take-off tubes. No information as to its speed has been released. However, officials claim it will be faster than today's jet fighters. The other plane, Curtiss-Wright's four-jet fighter XP-87, is now undergoing ground and taxi tests. It is operated by two-man crew, is powered by four Westinghouse jet units, and has an over-all length of about 65 feet.

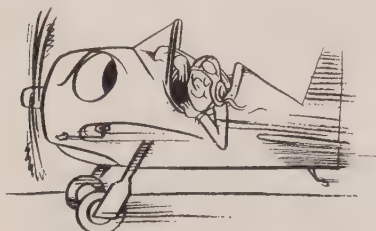
CURTISS XP-87 is AF's first four-jet fighter plane. It carries crew of two





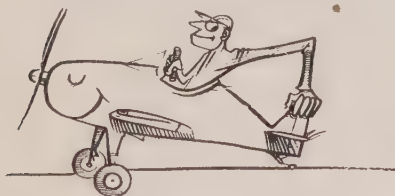
(Continued from page 43)

airplane is under complete control. On the ground your engine blanks out your view ahead. So for taxiing raise your seat as high as you can while still getting full throw of your rudder and brakes. In addition, "S" turn as you go along, so you will have visual assurance that your way is clear at all times. Failure on this point is perhaps the biggest single cause of taxi accidents. And don't stare fixedly over one side of the cockpit; there may be a tractor on the other side!



"One-sided Dilbert"

**Keep Your Tail Down**—The flippers are used for this purpose. When taxiing into the wind, keeping the stick back will put the flippers up and force the tail down. If you hit a soft spot or start to nose over when applying brakes too abruptly, a blast from the propeller with the stick full back usually will blow your tail back down and

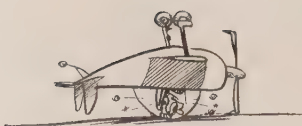


"Keep yer tail down"

prevent a nose up. That's one reason why you should always taxi with your hand on the throttle.

When taxiing downwind, the flippers should be down, stick forward. In this position, a sudden gust of wind, instead of lifting your tail, will force it down. Flippers in the correct position will hold your tail down; into the wind, stick back; down wind, stick forward. You get both conditions during a 180° turn and must reverse controls. Of course, in a very light breeze, where the propeller blast is more effective on the flippers than the wind, you naturally keep your stick back all the way around. In other words, you can't fly by rule-of-thumb. You've got to know what results you want, and then know what to do to get them under all conditions.

**Turn Around But Not Over**—Particularly in taxiing lightplanes, ailerons may be of assistance in two ways: to help turn and to keep from tipping over. Unfortunately, the same movement of the stick may help you turn in one case, but tip you over in another. Because of this complication and since it is most important that you stay right



"Around . . . not over"

side up, I'm only going to give you this part of it now. To prevent the wind from getting under your wing and upsetting you when turning or taxiing crosswind, simply hold your windward wing down by pushing your stick to windward. Note this also requires reversing the stick during a 180° turn. You already know how to use your rudder for turning. After you become more expert, any good book on aerodynamics will explain how ailerons also can be of some help in turning.

Never begin a turn when standing still; start the plane moving ahead first. In a turn, short blasts of the prop are safer and will give you better control. And don't turn too fast. If you do the centrifugal force will tend to tip the plane toward the outside of the turn. Just a touch of this and the wind will get under the inside wing and . . . your training will be delayed during repairs.

**Don't Get Embarrassed**—Due to the tendency of airplanes to turn into the wind, "weathercocking," upwind turns are easier and require less area to complete than downwind turns. In close quarters, or in strong winds where a successful turn becomes doubtful, stow your pride. Ask for help; get someone on that downwind wing. Or even get out and lift the tail around yourself. It's the only way to whip these hazards, so there is nothing to be self-conscious or embarrassed about. I can promise you that failure to take such action is very apt to cause you much greater embarrassment, both mental and financial. The latter results from receiving the bill for repairs to both planes, your own and the one you swung into.

Here's another good reason for always taxiing with your hand on the throttle. It has to do with collisions. If, like Dilbert, you have been doping off, or if your judgment or technique has been faulty and a collision becomes inevitable, mister, chop that throttle pronto. Also cut all switches. As long as your prop is turning over, it's a buzz saw.

**Pilots**, winter is going to be here soon, so let's go over a list of things *not* to do. This is reprinted from another issue of SKYWAYS. The time may be different but the laws are the same:

1. Don't attempt to take off with frost on wings or tail surfaces. A slight deposit that is barely visible may double the wing drag and reduce available lift. Rubber scrapers or waste rags should be used to remove frost.
2. Don't attempt to take off with any loose snow on the wing or tail surfaces. Snow also reduces lift and it may be covering a hard ice formation caused by melted snow which has refrozen. Give your plane an exterior line check (and don't forget the cockpit check) after any precipitation during cold weather. Snow may be removed from flat surfaces by using a rope or strip of canvas, and with a man at each end, "sawing" it off.
3. Don't try to take off with ice on the

airplane or propeller. And don't attempt to remove the ice by applying hot water. It will freeze again and produce a worse condition.

4. Don't take off without first testing all the plane's controls to make certain the hinges have not frozen.

5. Don't warm the engine in a fog when temperature is near freezing. Ice may form on propeller and on wings and stabilizer in back of prop blast.

6. Don't taxi fast over pools of water when temperatures are near freezing. Splashed water may form thin ice on wings or stabilizer and may ice up brakes, retracting mechanism or landing gear.

7. Don't taxi fast on ice-coated runways or taxi strips. It's surprising how many pilots have to learn this one the expensive way.

8. Don't take off during a wet snow. It is likely to freeze as it strikes the plane.

9. Don't forget that in cold weather engines heat up slower and are, therefore, more prone to foul. They should be thoroughly cleared immediately before take-off.

10. Don't take off into a known icing condition when the plane is not equipped with modern de-icing equipment and anti-icing fluids. Even though the craft is so equipped, flights should not be planned to go through continuous icing zones.

11. Don't apply brakes suddenly after landing on a runway that may be coated with ice. Use the full runway. Check runway conditions by radio before landing.

**In the Air**—1. Don't continue to fly into a region of known icing conditions.

2. Don't fly through rain showers or wet snow when the temperature at flight level is near freezing. It will freeze as it strikes.

3. Don't fly parallel to a front under icing conditions.

4. Don't fly into clouds at low altitude above crests of ridges or mountains. Four or five thousand feet clearance should be maintained when flying on instruments through clouds at temperatures below freezing.

5. Don't fly into cumulus clouds at low temperatures. Heavy glaze ice may be met.

6. Don't forget to turn on the pitot tube heater when needed. These heaters can be checked only on the ground. Pitot tubes should be covered when planes are parked.

7. Don't land with wing de-icers on. They act as spoilers if left on. Turn them off on base leg.

8. Don't make steep turns, practice stalls or spins, land with power off or try to climb too fast when ice has formed on the plane. Ice increases the stalling speed of an aircraft because of increased weight and drag as well as decreased lift.

9. Don't forget when flying under icing conditions that gasoline consumption is greater than normal due to the additional power required to maintain flight.

10. Don't forget that turning on carburetor preheat or using alternate air intake, the latter *before* entering any weather when there is possibility of icing, may make all the difference as to whether you get through or not. Many pilots are woefully lacking in both general and specific knowledge on this subject. You can ice up even though you cannot see the moisture in the air.

11. If you can't control carburetor ice *land* while you have enough power to control the plane.

12. Maintain your flying speed!



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## BOOKS

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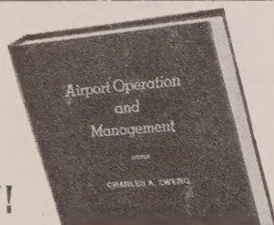
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**Don't Miss**

## JET for the FLEET

A story of development of jet and prop-jet for powering our Navy's fighting planes

**December SKYWAYS**

## NAR's on Duty

(Continued from page 20)

least four hours of Link time, more if he needed it. All Stations are now equipped with the latest-type Link Trainers. These are not yet available in any civilian school.

Lectures and practical demonstrations were staged in engineering, engines, weather and new equipment. Of the latter, the reservists train on the same gadgets used by the fleet. The Navy makes no distinctions. First-line aircraft and the latest training aids help keep the men ready for instant call.

Rube Denoff mentioned that skeet and trap shooting was part of each day's routine, and that the athletic phase of Naval life was not forgotten. Glenview has, among other facilities, an 18-hole golf course.

"Enlisted men took up their squadron duties same as in wartime," said Maurie Wells. "They kept the planes in shape, worked in the tower, operated radio and radar," he continued. They also attended their quota of lectures. A program of technical training is now underway at all Reserve Air Stations. Under specially trained instructors, reserve enlisted men learn valuable skills exactly as if enlisted in the regular Navy. "If you had to?" I asked Lt. Cmdr. Wells.

"You bet!" he answered. "They are as good a gang as any I've worked with."

The Naval Air Reserve, in its 21 stations, has nearly 30,000 officers and enlisted men who train on the same basis as Air Group 82. There are groups for all the various carrier types, as well as land-based patrol squadrons and Naval Air Transport squadrons. They fly 48 week-ends and a two-week full-time active duty period each year. They are paid for their time and thus receive about two-months pay for their rank or rate. It's a fine deal for them, a better deal for this country. A well-trained reserve air force would have shortened the war by many months if it had been available when World War II started, army experts claim.

"I'd be out here even if I weren't paid," Maurie Wells said. "Maybe I wouldn't come if I couldn't fly, but this way I keep my hand in."

Then he added, with a slight touch of embarrassment, "Also, with the world in the shape it's in, I think I darn well better keep flying. Maybe I'll be needed one of these days. I want to be ready."



## On the Air

(Continued from page 48)

**WRONG**—What you have just said is wrong. The correct version is—

**BREAK**—To be used to indicate a separation in the message such as between portions of the message. It is only used when there is a distinction between portions of the text.

Now that we have a pretty fair working knowledge of how to use a radiotelephone, let's take up the matter of making it legal. In order to use a two-way radiotelephone it is necessary to hold a third class, radiotelephone license, obtainable from your local airport. This license is issued by the Federal Communications Commission, costs \$1.00, and is good for five years. Complete information about obtaining such a certificate may be obtained in booklet form from your nearest FCC Office. The booklet entitled "Study Guide and Reference Material for Commercial Radio Operators Examinations" will give you all the information you'll need for such a ticket. They are simple to obtain, are called "Restricted Radio Telephone Operator Permits" and, . . . it's tough luck to be caught using a radio transmitter *without* one.

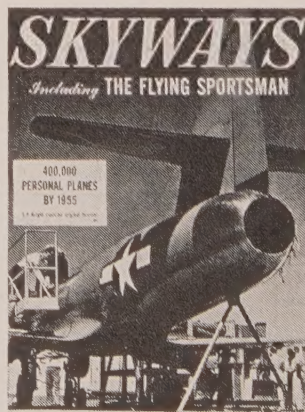
Now that you have a radio, know how to use it, and have a ticket making it legal and proper all tucked away in your billfold, you'll find that private flying is many times more pleasant and safer. **"I SAY AGAIN—MANY TIMES MORE PLEASANT AND SAFER—OUT!"**

### PHONETIC ALPHABET:

A ABLE	N NAN
B BAKER	O OBOE
C CHARLIE	P PETER
D DOG	Q QUEEN
E EASY	R ROGER
F FOX	S SUGAR
G GEORGE	T TARE
H HOW	U UNCLE
I ITEM	V VICTOR
J JIG	W WILLIAM
K KING	X XRAY
L LOVE	Y YOKE
M MIKE	Z ZEBRA

### NUMERICAL PRONUNCIATION CHART:

0 ZERO	6 SIX
1 WUN	7 SEVEN
2 TOO	8 ATE
3 THUH-REE	9 NI-YEN
4 FO-WER	100 HUN-DRED
5 FI-YIV	1,000 THOW-ZAND



## PICTURE CREDITS

**COVER** — Designed for transonic-speed research, the Douglas-built D-558 recently made headlines when it broke existing speed records in three consecutive speed tests. Powerplant used in the Skystreak which hit 653.4 mph was a G-E designed, Allison-built TG180, delivering 4,000 pounds of thrust without water injection. Three models are being built.

The following list gives source of pictures used in this issue of SKYWAYS

18, 19, 20—R. YAMBERT; 21, 22, 23, 24—DON DOWNIE; 25—MARTIN & KELMAN; 28, 29—AERONCA; 30, 31—ROSS, RUDY ARNOLD; 32, 33, 34—CLOSE; 35—ADAMS; 36, 37—CAA, IAS; 40, 41—GALIMBERTI, ROSS, ACME, LEVY, FLIGHT; 45—USMC, TWA; 46—ROSS.



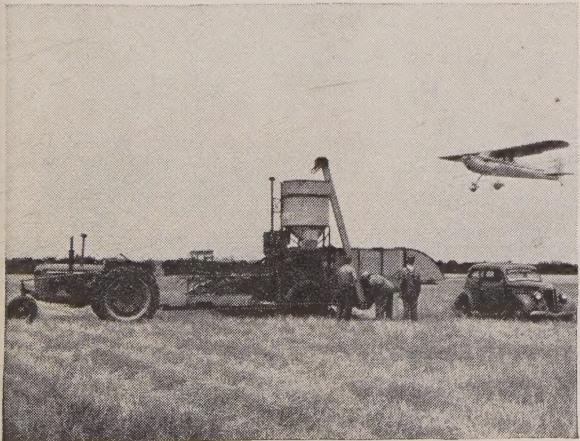


**LIBERAL AIRCRAFT's Paul Radkee, going to farmer's rescue, tells Pilot Hockensmith where to deliver parts**

# HARVEST HELPER

**P**ERHAPS only a farmer knows what it means to have some piece of machinery break down right in the middle of harvest operations. But it's no secret that such a breakdown often means the difference between profit and loss. Out Kansas way, the Liberal Aircraft Co. did something about it. Paul Radkee, owner of Liberal Aircraft, advertised that his planes would help farmers save time and money in cases of machinery breakdown by flying replacement parts directly to the farmer's field. In short order, many of Kansas' farmers took advantage of Mr. Radkee's service and had replacement parts flown to them in Liberal Aircraft's Cessnas. In fact, three Cessnas were kept busy all day every day during the harvest season delivering needed parts, repairs and servicemen to the fields. The planes averaged nine trips a day, and several times went as far as Kansas City, Oklahoma City or Lincoln, Nebraska, to secure hard-to-get parts for some farmer's harvest machinery. A new service caught on in a hurry.

**FARMERS welcome approaching plane and its cargo of spare parts that will put machinery back to work**



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| <input type="checkbox"/> Technical Courses       | <input type="checkbox"/> Instrument Course          |
| <input type="checkbox"/> Private Pilot Course    | <input type="checkbox"/> Flight Instructors Course  |
| <input type="checkbox"/> Commercial Pilot Course | <input type="checkbox"/> Multi-Engine Rating Course |

Check One: ☐ Veteran ☐ Non-Veteran

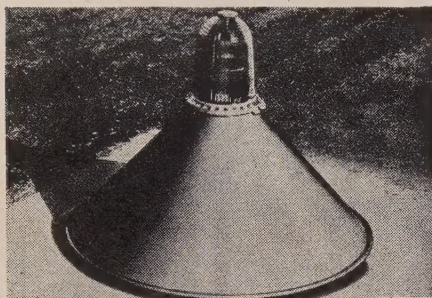


# AIR NEWS

## AERO-EQUIPMENT

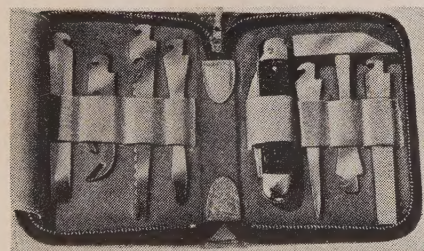
### RUNWAY, STRIP MARKER LIGHTS

The American Gas Accumulator Company of Elizabeth, N. J., has come up with an elevated runway, strip and taxi-way marker light (*below*). The new light offers more visibility than the conventional semi-flush unit. These lights are designed to meet CAA specifications, are distributed through General Electric, Schenectady, N. Y.



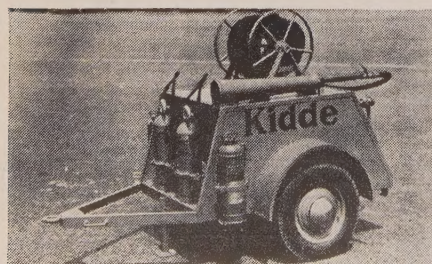
### TOOL KIT

A new and better tool kit (*below*) has been designed by Dexter & Co., New York. This handy and practical kit contains a man-sized jackknife and seven slip-on accessories including: hammer, file, awl, screwdriver, opener, scaler and chisel. Set comes in a pigskin case with zipper fastener. \$10 postpaid.



### FIRE TRAILER

The Walter Kidde & Company, of Belleville, N. J., has announced this new trailer (*below*) for use by small airport operators, etc. It carries 300 pounds of carbon dioxide for fighting fires. Stored in six 50-pound cylinders, the carbon dioxide is discharged onto the fire through a nozzle attached to 100 feet of one-inch hose. In addition the trailer contains two 20-pound carbon dioxide portable extinguishers and two 2½-gallon water extinguishers. Unit is equipped with standard tow bar for attachment to vehicle.



### FIRE EXTINGUISHER

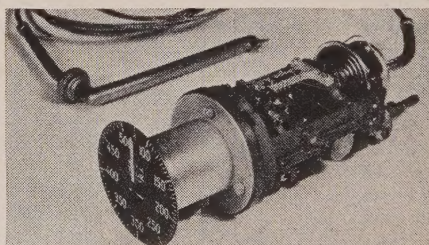
The Ansul Chemical Co., of Marinette, Wis., announced a new four-pound dry chemical fire-

extinguisher known as the Ansul 4. The extinguisher is 19½ inches long, 3¼ inches in diameter. Useful in airport storage rooms, etc.



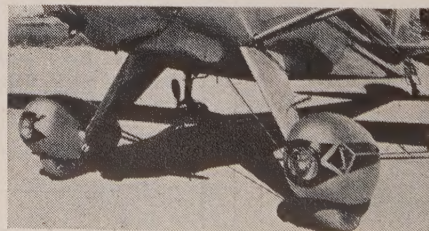
### SYNCHROTEL

This new electro-mechanical control device, developed by Kollsman Instrument Division, is now being offered to aviation industries. The Synchrotel (*below*) is in essence an AC synchomotor, or an electromagnetic pickoff device. It can be attached directly to the pointer of most sensitive aircraft instrument, will convert instrument's reading into electrical signals which can be sent to a remote station with accuracies of a fraction of a degree. The signals may be used in a servomechanism to direct an airplane, control engine temperature, operate flight recorder or make air-speed adjustment in a bombsight.



### AVIATION ACCESSORIES

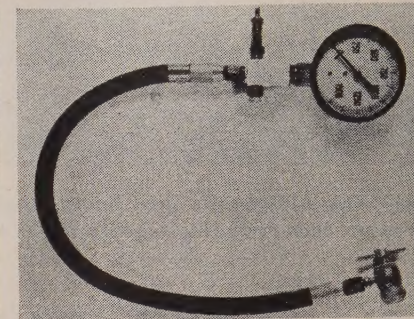
Lightstream wheel lights, using Plexiglas lenses to protect sealed beam lighting units, have been developed for civilian aircraft by Aviation Accessories Corp., Fort Worth, Texas. The lights, shown on *Silvaire* (*below*), mounted in fixed gear wheel pants, are attached quickly and easily to the landing gear. Each lens is adjusted so that light beam strikes ground 400 feet in front of aircraft in level flight at altitude of 15 feet prior to landing stall. Special cuts are made for installation on retractable landing gear aircraft.



### AIRPLANE GAUGING

A. Schrader's Son, specializing in air-control products, has added improvements, refinements to its gauging device for shock struts. Through this device ground crews can safely inflate, de-

flate and gauge pressure of landing gear cylinders, accumulators.



## PERSONNELS

Allen D. Emil, legal counselor for Kollsman Instrument Division, sailed for England to attend the joint meetings of the Royal Aeronautical Society and Institute of Aeronautical Sciences.

The American Society of Mechanical Engineers, at their Salt Lake City meeting, awarded John K. Northrop, head of Northrop Aircraft, the Spirit of St. Louis Medal for his development of the *Flying Wing* and other contributions to aeronautical science. This award is the highest aviation honor offered by the Society.

Mr. E. W. Deck, former General Manager of Trent Tube Manufacturing Co., has been retained by Borg-Warner Corporation as a consultant on manufacturing research. The appointment was announced by C. S. Davis, President of Borg-Warner.

National Airlines' Cuba representative, Robert E. Weiland, recently was elected a director of Radio Aeronautica de Cuba, S. A.

Twentieth Century-Fox director Henry King accepted delivery on his new four-place *Bonanza* at Wichita, Kansas. Mr. King will use his new ship for traveling around the U. S. spotting locations for Twentieth Century-Fox movies.

Stanley G. King, vice president and managing director of American Airlines of Mexico, recently was elected president and managing director. This title was formerly held by C. R. Smith, chairman of the board of directors of American Airlines, the parent company.

John D. Kay of the Coast and Geodetic Survey has been appointed Assistant to the Administrator for Aeronautical Charts.

Dr. George W. Lewis, Director of Aeronautical Research for the National Advisory Committee for Aeronautics, has been appointed Research Consultant to the NACA. Dr. Hugh L. Dryden will succeed Dr. Lewis as Director of Aeronautical Research.

Mr. Wallace O. Leonard has been appointed Assistant to the President of Pacific Airmotive Corporation. Mr. A. H. Meyer has been appointed Director of Industrial Relations for PAC.